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GERMAN AIR DEFENSES
CHAPTER 2
1 September 1939-21 March 1941
BEGINNING OF THE WAR TO ESTABLISHMENT OF
AIR COMMAND CENTER

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The political events of the summer of 1939 which, after a period of dramatic tension between Germany and Poland, culminated on 1 September 1939 in the invasion of Poland by the German military forces, naturally gave rise at an early stage to thought and planning for possible German military operations in hypothetically stated cases.

The political concepts of Germany's Reich Chancellor, Hitler, were clearly directed primarily towards a solution of the problems in the East.

This implied that in the event of any reaction by Germany's western neighbor states to politico-military action taken against the East by Germany, planning for military operations in the West was accordingly based on defensive warfare on the ground and in the air.

This is perfectly evident from the directives contained in Volume II of Operational Study 1939, which defines the employment of the air defense forces in the West in the conjectured event of armed conflict with Poland. The following passages are quoted from those directives:

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1. The overall situation requires that in Case Weiss /Fall "Weiss": more generally known as Plan Weiss, the code designation for all planning against the eventuality of war against Poland/ measures must be taken immediately to protect the western frontiers, the North Sea coastline, and the air over these areas. The directives for air defense against "Weiss" are therefore so adapted that no matter what happens, the concentration of air defense forces against the West can take place.

When the strained situation between Germany and Poland became so acute in August 1939 that a peaceful settlement seemed no longer possible, movements commenced from mid-August on, consonant with the established concept of attack in the East and defense in the West, to deploy the air forces according to the plans worked out against this eventuality.

The importance attached to carrying out the necessary measures as inconspicuously as possible and in a manner which would not make their revocation impossible was considered so great that the units intended for employment in the East themselves had no knowledge of the real purpose of their transfer to different tactical airfields from their current stations. In fact the real reason was concealed intentionally through the furnishing of unimportant reasons.

For example, the official reason offered for the air concentrations commencing on 15 August 1939 in Eastern Prussia was that the air units concerned were to participate in an air parade as part of the celebrations of the anniversary of the Battle of Tannenberg [^{in which German forces inflicted a shattering defeat on the Russians in} 1914] to be held at the monument erected there.

The reason given for the order that the units would take along their field equipment and their basic issue of ammunition was that while crossing the Polish Corridor level with Danzig they might come under attack by Polish fighters even though on their prescribed route across the sea and outside of Polish territorial waters.

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DISPOSITION OF AIR DEFENSE FORCES IN THE POLISH CAMPAIGN

In accordance with the appraisal of the Polish air forces, namely that most of their equipment was out-dated-- it was mentioned previously, above, that out of a total of 270 fighters only 30 were considered as Class 1-- it was considered unnecessary to allocate large regular defense forces, in the form of fighter and antiaircraft artillery units, for participation in any possible military operation against Poland, so that a concentration of air defense forces could be built up in the West without difficulty

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by allocating the bulk of these forces for that purpose.

The two air fleets, First and Fourth, assigned the mission of conducting air operations against Poland had available for attack and defense in the East the following forces:

1. Fighters: 5 groups, namely the 1st Groups of the 1st, 2nd, 76th, 77th Fighter Wings, and of the 2d Training Wing, the 1st squadron of the latter also being a fighter unit.

163. Source 3.

164. Source 85.

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2. Twin-Engine Fighters: 5 groups, namely the 1st Group each of the 76th & 1st Twin-Engine Fighter Wings, & of the 1st Training Wing, plus 101st & 102d Groups.
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3. Antiaircraft Artillery Forces: 10-12 battalions for mobile employment in the Army 166 zones of operations.

The fighter groups were intended initially exclusively for defense missions in the areas of the strategic concentration in the East. The 1st Group each of the 1st and 21st Fighter Wings were responsible for the air defense of Eastern Prussia, the 1st Group (including 1st Fighter Squadron), 2d Training Wing, for that of central areas, and the 1st Group each of the 76th and 77th Fighter Wings for that of Silesia.

After the first few days of the campaign, however, during which the eastern opponent, Poland, attempted no air attacks against German territory, all fighter groups were relieved of their defensive missions and employed in offensive missions. The purpose here was to achieve air supremacy and thereby protect the ground forces advancing into enemy territory against air attack and air reconnaissance.

165. Source 130.

166. Source 88.

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The concentrated bombing attacks launched against the Polish air forces in their bases and against their ground service organization in general almost completely paralyzed them within the first few days of the campaign so that the air threat was practically non-existent. The fighter forces therefore were employed increasingly in low-level attacks in direct support of the ground forces. When the time arrived that hostile units hardly put in an appearance any more at all, Polish pockets of resistance on the ground, troop and transport columns, supply depots, and rail and road traffic became the targets for attack by German fighters.

So far as the fighter arm was concerned a condition of total air warfare developed which closely resembled the operations of the Condor Legion in Spain in early 1939.¹⁶⁷

Apparently, the intellectual influence of General von Richthofen, last commander of the Condor Legion in Spain, was very effective in favor of the tactics of all-out commitment of air power to bring about the speediest possible end to an area really confined campaign.¹⁶⁸

What happened in the first week of the Polish campaign had fully vindicated the basic views established in the manual THE CONDUCT OF AIR OPERATIONS in Paragraph 16: that the danger of an air threat could never be countered adequately

167. Source 3.

168. Source 13.

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through air defense activities in the homeland alone and that it makes offensive operations against the hostile air forces on enemy terrain from the very outset of war a compelling necessity.

That the fighter arm was given such an important role as an offensive weapon in this scheme it would be hard to conceive were it not for the experience of the Condor Legion in Spain.

Of the 5 twin-engine fighter groups assigned in the East only three had Me-110 planes, namely, the 1st Group each of the 1st and 76th Twin-Engine Fighter Wings, and the 1st (Heavy Fighter) Group of the 1st Training Wing.

In each of these three groups the headquarters units and 2 squadrons had Me-110-C aircraft, powered by 2 DB-601-A engines, while the other squadron still had Me-110-B planes, powered by 2 Jumo-210 engines, with considerably less satisfactory performances.

One group, the 102d, still had its old Me-109-D planes with a two-and-one-half hour in-the-air capability, and one group, the 101st, was equipped with Me-109-Es with an in-the-air capability of only 90 minutes.

Since these groups actually only had the combat value of normal fighter units, their original designation as the 1st Group, 2d Twin-engine Fighter Wing and 2d Group, 1st

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Twin-Engine Fighter Group was changed on 1 September 1939 to 102d and 101st Fighter group, respectively. The purpose here was to facilitate recognition of the genuine twin-engine fighter units by the commanding headquarters.

According to the operational plans prepared against the eventuality of implementation of Plan Weiss, the five twin-engine fighter groups were intended from the outset to provide escorts for the bomber and dive-bomber forces.

That no reserves were withheld from these units to reinforce the air defenses against the East can be explained by two reasons:

(1) The German appraisal of a possible air threat through the Polish air forces was that this threat was very small. Thus, it was assumed that out of a total of 170 Polish bombers only 130 were Class 1 aircraft.

(2) Experience in Spain had shown that friendly

169. Source 18.

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bomber forces, if they were to execute their strategic missions required protection by friendly fighters (twin-engine) at least until air supremacy was established over enemy territory through annihilation of the hostile air forces.

At the end of the first week of the campaign the twin-engine fighter groups, because the Polish fighter defenses by then had been reduced to insignificance, also were committed principally in low-level attacks against rail and road targets in the Polish rear but also at times in combined attacks with fighter and dive-bomber units in areas of main effort in the battle on the ground.

The tremendously destructive fire of the six weapons--2 cannon and 4 machine guns--mounted rigidly within a small space in the cockpit against all types of targets on the ground produced spectacular results in these attacks.¹⁷⁰

The final reports on a single twin-engine fighter group, the 1st (Heavy Fighter) Group, 1st Training Wing on operations in the Polish campaign show the following figures:

Complete unit missions were flown on 12 days

In 18 air battles 30 Polish aircraft were shot down and two were destroyed on the ground;

8 annihilating attacks were flown at low altitudes against Polish troop assemblies and moving columns

170. Source 3.

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In 8 attacks at low altitudes against rail targets units of the group

shot 6 rail trains on fire and

destroyed 35 locomotives.

The superiority of the German fighters and twin-engine fighters over the Polish fighter defenses was impressively proved.

In the first few days of the campaign the German force of only 5 twin-engine fighter groups totalling 150 aircraft were opposed by an estimated force of 170 Polish fighters equipped with Types PZL-23 and 24 planes, of which the latter although outdated in their construction as high-decker monoplanes had powerful engines which gave them the performances approximating those of the Russian Rata model. Within a few days the Polish fighter defense forces were annihilated through destruction caused on the ground by German bombing attacks and through the large numbers shot down in air combat by the fighters escorting the German bomber forces, at the cost of hardly appreciable losses in German bomber or twin-engine fighter units.

From that stage on absolute German air supremacy over the Polish territories made it possible for the German commands to employ their air forces to the limits of their capabilities and finally turned the whole campaign into

171. Source 89.

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a blitz war of unprecedented shortness.

It is obvious that the events of the Polish campaign gave the concept of "The attack is the best form of defense" added impulse so far as the future use of the fighter and twin-engine fighter arms were concerned.

In the eighteen days that the Polish campaign lasted the antiaircraft artillery units attached to the various Army corps artillery forces had few opportunities to prove their efficacy in their mission of air defense.

The unit commanders, most of whom came from the army and a number of whom had served with the Condor Legion in Spain, were dissatisfied with merely accompanying the corps artillery forces during the advance. Pointing out the excellent ballistic features of their weapons for ground combat missions, in which their rapid-fire guns were superior to the normal army artillery, they offered their services against ground targets.

Wherever these offers were accepted the use of the antiaircraft guns resulted in quick and complete success, as was the case in the battles for Graudenz (1st Battalion, 11th Antiaircraft Regiment), at Mlava and Warsaw (2d Battalion, 11th Antiaircraft Artillery Regiment), in the Narev line (1st Battalion, 11th Antiaircraft Artillery Regiment).

Among the actions fought by the antiaircraft artillery

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in this brief campaign a particularly conspicuous case is that of the action carried through by the 1st Battalion, 22d Antiaircraft Artillery Regiment, at the Bezura River at a heavy cost in losses and under the most difficult combat conditions. Thrown back completely on its own resources the battalion, in close combat action in closed terrain repelled the bitterly tenacious breakout attempts of vastly superior enveloped Polish forces and thereby made a decisive contribution toward victory in one of the most important and successful battles fought in the whole campaign.

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172. Sources 88, 185.

Coupled with thoughts of the principles of power concentration this purely offensive use in ground combat of a weapon intended initially for air defense missions, a use which had proved so und repeatedly in Spain and achieved decisive results in the Polish Campaign, produced the foundation for a concept which was to materialize only a few weeks later in the consolidation of motorized antiaircraft artillery units to form anti-aircraft artillery corps as a strategic reserve of the Commander-in-Chief of the Luftwaffe, a subject which will be dealt with more fully later in this study.

It can be established here that the most prominent features of Polish campaign were (1) the extreme value of the fighter and antiaircraft artillery arms in the offensive and (2) the resultant ability of the German side to retain the initiative in solving the air defense problem by denying the enemy any chance from the first day on to play out his cards of air attack.

GERMAN AIR DEFENSES IN THE WEST AT THE OUTBREAK OF WAR

It is now time to consider the air defense situation in the West as it existed at the beginning of the war.

The basic principles had been established in Operational Study 1939, Volume III, and these principles

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were the governing factor in the disposition of the air defense forces against the West.

Parts of the study stated as follows:

.....

2. In air defense the mission is to protect all installations and establishments vitally important for the conduct of the war within all German territories....

Air Command North (Second Air Fleet) will be responsible primarily for protection of the air defense areas within its command zones. Furthermore, protection will be provided for air defense targets of Categories 1 and 2.

Protection of the gunpowder and other explosives industries is of particular importance.

Protection of the waterways important for supplies to the Ruhr region will be insured in accordance with the forces available for this purpose.

In providing protection for communication facilities main emphasis will be on protection for transportation roads. In particular light reserve antiaircraft (machine-gun) platoons will be assigned to protect road bridges over the Rhine and Weser Rivers wherever the defensive powers of the local individual target protection services are inadequate. The Commanding General, Air Command

North, is responsible for the protection of the Rhine River bridges within his command zones against both high and low altitude attacks.

Main emphasis in defense of the ground service organization is at the air bases of the strategic concentration. Adequate forces will be committed for this purpose. In accordance with the forces available the more important other military installations will also be protected.

Air Command West (Third Air Fleet) will defend the most important armament factories and cities within its command zones. Main concentrations will be developed to protect the cities of Frankfurt, Mannheim, Stuttgart, Nuremberg, and Munich, and their surroundings.

Among the factories listed as Category I and II in Reich Air Defense Target Register, particular importance attaches to the gunpowder and explosives factories.

The antiaircraft artillery forces committed in Air Defense Zone West will be placed, already in times of tension, under the air district commands within whose command areas they are. The Commanding General, Air Command West is authorized for this purpose to withdraw units from Air Defense Zone West for assignment elsewhere.

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If Air Command West is assigned reinforcements from other command zones, these may be used to improve air defenses in a line extending from Pforzheim through Rottweil to Singen as an extension of Air Defense Zone West apart from the forces assigned to protect specific targets. Such measures to reinforce the general air defense shall only be taken, however, after adequate provisions have been made for the execution of all other missions.

In other respects it is a responsibility of the Commanding General, Air Command West, to take measures to compensate for the lack of forces through maintaining a firm control of all available forces and through developing power concentrations consonant with the current air situation.

In the protection of communication facilities main emphasis will be placed on protection of the transport roads. Power concentrations will be developed at the

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transport road bridges across the Rhine and Danube Rivers.

Insofar as forces are available beyond the above requirements protection will be provided for other communication facilities classified as Category I or II.

The Commanding General, Air Command West is responsible for the defense of the Rhine River bridges within his command zones.

Measures will be taken to insure protection of the ground service organization, particularly of the bases for the strategic concentration....

One noticeable feature about these directives is that the southern part of Air Defense Zone ^{West} apparently is not accorded the degree of importance which would correspond to the large expenditure of effort its creation had cost. Possibly this is due to the low appraisal of the offensive capabilities of the French bomber forces, in contrast with which the threat which the British air forces constituted for the more northerly territories of Germany was considered more serious.

The fact that the main industrial regions were within these areas, for the preservation of which industries the antiaircraft barrier was of direct importance in the sense of direct target defense, gave to Air Defense Zone West a

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particularly high degree of importance.

The practical results of these basic concepts, established as early as on 1 May 1935 for the strategic concentration in the West, were as follows mobilization:

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Mobilization plans, as effective on 1 April 1939, provided for activation of the following units for the fighter arm in the event of war:

1. Fighter units 6 wing headquarters
 27 group headquarters
 81 squadrons
 4 replacement squadrons
2. Night fighter units 4 squadrons
3. Twin-engine fighter 3 wing headquarters
 units
 10 group headquarters
 30 squadrons
 2 replacement squadrons
4. Schools 2 fighter pilot schools
 1 twin-engine fighter pilot
 school
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At the time when these plans were prepared, 14 September 1938 the following units were in existence:

1. Fighter units 3 wing headquarters
 20 group headquarters
 60 squadrons
2. Night fighter units none
3. Twin-engine fighter units 1 training group
4. Schools 1 fighter pilot school

173. Source 90.

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Mobilization plans valid from 1 April 1939 on thus provided for a total wartime strength in the fighter arm of 9 fighter wings with 47 groups 3 twin-engine fighter wings with 11 groups 4 night fighter squadrons.

With the units newly established on 1 November 1938 and the separation of the fighter forces in what were called light and heavy fighter forces in December of the same year a part of the mobilization plan program was already fulfilled.

The newly established units were as follows:

1. Fighters	1 wing headquarters
	1 group headquarters
	4 squadrons
2. Twin-engine fighters	7 group headquarters
	21 squadrons (taken from the existing fighter forces).

By 15 August 1939 the following additional units were established:

1. Fighters	1 wing headquarters
	1 group headquarters
	4 squadrons
2. Night fighters	3 group headquarters
	12 squadrons

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3. Twin-engine fighters

1 wing headquarters
2 group headquarters
6 squadrons

4. Schools

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1 fighter pilot school.

A comparison of the status as of 14 September 1938

with that of 15 August reveals the following accretions

and reductions:

Status	Fighter			Night Fighter			Twin-Engine Fighter		
	Wings	Gps	Sqds	Wings	Gps	Sqds	Wings	Gps	Sqds
9 Sep 38	3	20	60	0	0	0	0	1	3
15 Aug 39	5	14	44	0	0	0	1	10	-30
Accretion	2			3	12		1	9	27
Reduction		6	16						

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It is thus obvious that more than 50 percent of the increase in twin-engine and night fighter units was at the expense of the normal fighter forces, with the number of night fighter units showing an increase of 200 percent above the original authorization.

If in planning the normal and twin-engine fighter units had been considered as belonging to one and the same arm, the following program for new activations at the outbreak of war would have evolved:

6 wing and 24 group headquarters and 110 squadrons.

The actual situation on 1 September 1939 was, however, that there were neither enough personnel nor enough aircraft for a unit activation program of this size.

To give the air defenses in the West the greatest possible strength in fighter forces the following measures were taken:

1. The units intended as night fighters and just created for the purpose in August 1939 were transferred to the daylight fighter forces. These were the 1st Groups each of the 20th and 21st Fighter Wings, the 2d Group (minus 1 squadron) of the 71st, and the 10th Squadron of the 72d Fighter Wings. The actual strength in fighter forces was thus increased by three groups.

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2. The twin-engine fighter units not committed as such in the Polish campaign were allocated for employment in purely daylight missions. These were the 26th Twin-Engine Fighter Wing of 2 groups with Me-109-D planes, the 126th Fighter Group with Me-109-B/C planes, and the 152d and 176th Fighter Groups, both with Me-109-B/C planes. The three latter groups had been given these new designations to mark their small time-in-air capacities and were identical with the units formerly designated 3d Group, 26th, 1st Group 52d, and 2d Group, 76th Twin-Engine Fighter Wings. It should be borne in mind here, that most of the units intended for and designated as twin-engine units, still had single-engine planes, usually of the older types.

3. A group, the 1st Group, 51st Fighter Wing, intended for reequippment as a twin-engine unit remained with the normal fighter forces.

4. 1 Fighter group, the 2d Group, 52d Fighter Wing was newly activated in measures commencing on 15 August 1939.¹⁷⁵

After completion of the movements carried out between 15 August and 1 September 1939 the disposition of fighter and twin-engine fighter forces for defense against the West and, in the case of Air District Commands III and IV, simultaneously against the East was as follows:

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A. First Air Fleet Zone of Command.

Unit	Tactical Base	Aircraft Type	Assgd Defense Area	Air District Command
<u>Hq, 2d Fighter Wing</u>	Dosberitz	Me-109-E	General	III
1st Group	"	"	area	"
1st " , 20th Wing minus 1 squadron	Brandenburg	Me-109-D	Berlin	"
10th Sq, 2d Wing	Fuersten- walde	Ar-68	Night Defense	"
<u>Hq, 3d Fighter Wing</u>	Brandis	Me-109-E	Halle-	IV
1st Group	"	"	Leipzig	"

175. Source 18.

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* B. SECOND AIR FLEET-ZONE OF COMMAND

Unit	Tactical T Base	Aircraft Type	Assgd Defense Area	Air District Command
Hq, 26th Fighter Wing	Duesseldorf	Me-109E	Ruhr	VI
1st Group	Koeln-Gymnich	"	Region	"
2d "	Duesseldorf	"	"	"
10th Squadron (Night defenses)	"	Ar-68	"	"
1st Group, 52d				
52d Wing	Boenninghardt	Me-109-E	"	"
2d Group, 26th Werl/Stoermede Twin-Eng Wing		Me-109-D	"	"
Hq, 26th Twin-Eng Wing	Varel	Me-109-D	Hellingo- goland	XI
1st Group	"	"	"	"
2d Group, 77th Fight. Wing	Nordholz	Me-109-E	Bight	"
2d Group, 186th Fight. Wing	Kiel	Me-109-T	"	"
126th Fight. Group	Neumuenster	Me-109-B/C	"	"
11th Squadron, 2d Greifswald(?) Tng Wing	Greifswald(?)	Ar-68 Night Def.	"	"

C. THIRD AIR FLEET ZONE OF COMMAND

HQ, 52d Fighter Wing	Mannheim	Me-109-E	Mannheim-	XII
1st Group, 51st Fight Wing	"	"	Stuttgart	"
10th Squadron, 72d Fight. Wing	"	Me-109-D	Area	"
2d Group, 52d Fight Wing	Germersheim	Me-109-E	"	"
HQ, 53d Fighter Wing	Wiesbaden	Me-109-E	Frankfurt	"
1st Group	"	"	"	"
2d Group	Mannheim	"	"	"

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C. THIRD AIR FLEET ZONE OF COMMAND--cont.

Unit	Tactical Base	Aircraft Type	Assgd Defense Area	Air District Command
152d Fighter Group	Biblis	Me-109-B/C	Frankfurt	XII
1st Group, 54th Fighter Wing	Boeblingen	Me-109-E	Stuttgart	VII
1st Group, 176th Fighter Wing	Hechingen	Me-109-B/C	Stuttgart	VII
2d Group, 71st Fighter Wing	Fuerstenfeld- bruck	Me-109-D	Munich	176 VII

In order to convey an intelligible impression of the combat strength of the forces involved, the following information is offered on the composition of the units and their effective strengths on 1 September 1939:

1. Fighter Wing HQ : Authorized Strength 3 combat planes
 2. Fighter Group HQ : " " 4 "
 3. Fighter Squadron : " " 12 "
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Each fighter group was organized in a headquarters with headquarters company, including a signal platoon, and three squadrons.

The authorized strength of a fighter group thus totalled forty aircraft.

The total authorized strength of the fighter and forces twin-engine/^{forss} fighter committed for air defense in the West was thus:

176. Sources 18, 49, 91, 92, 93, 94, 95, 96, 97, 98, 99,
100.
177. Source 54.

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A. FIRST AND SECOND AIR FLEET COMMAND ZONES.

4 wing headquarters, each 3 aircraft	12 aircraft	
10 2/3 groups "	" 40 "	428 "
3 Night fighter sqadrons, each 12 aircraft		<u>36</u>
Total		476 aircraft

B. THIRD AIR FLEET ZONE OF COMMAND

2 group headquarters, each 3 aircraft	6 aircraft	
8 groups	each 40 "	320 "
1 squadron		<u>12</u> "
		338

The overall authorized strength of the fighter units stationed in the West on 1 September 1939 was thus 476 plus 338, making 814 aircraft.

The only sources from which the actual strengths and the effective strengths can be computed are the overall figures available on the subject, which include the forces committed against Poland, in the report of the Chief of Luftwaffe Supply and Administration dated 2 September 1939.

By applying the ratio of authorized to actual and effective strengths deducible from those figures, however, it is possible to arrive at a fairly reliable picture.

The factor being used in calculations here is the number of crews available, since these represented the actually available effective strength, even if a greater number of planes may have been available than crews. In the

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authorized strengths the number of crews in each unit naturally equals the number of planes it had.

The Report quoted gives the following strengths in crews

	Authorized	Actual	Effective
1. Fighters	811	672	633
2. Twin-Engine Fighters	438	384	373

For the fighter forces the percentage of authorized strength actually in the units was 89.2, the effective percentage was 78 percent.

In the twin-engine fighter forces the actual strength was 87.6 percent of the authorized figure, the effective strength 85.2 percent.

For both the fighter and twin-engine fighter forces together the effective strength was $\frac{78 + 85.2}{2}$ and thus 81.6 percent of the authorized strength.

Applying this factor of 81.6 percent to the overall strength of the fighter and fighter forces in the West, computed at the authorized figure of 814, an effective strength was thus available of 664 crews with aircraft.

Calculating this figure pro rata for the various defense areas produces the following picture:

Area	Number of Units	Authorized Strength	Effective Strength
General area of Berlin	1 wing and 2 1/3 groups	95	77

		226a		
carried forward		95		77
Halle-Leipzig	1 wing and 1 group	43		35
Ruhr Region	1 wing and 4 1/3 groups	175		143
Helligoland Bight	1 wing and 4 groups	163		133
Frankfurt	1 wing and 3 groups	123		100
Mannheim- Stuttgart	1 wing and 4 1/3 groups	175		143
Munich	1 group	<u>40</u>		<u>33</u>
Totals		814		664

Accordingly, the main concentration of fighter forces in the West was in the central areas between Wesel and Mannheim. With the operating ranges of the units being what they were, between 350 and 400 fighters and twin-engine fighters could go into action against an enemy force within a very short span of time at any point within this area.

Here it must be borne in mind that the Me-109-B/C and E units, in spite of their short time-in-air capacities, had a striking range of approximately 240 miles from their take-off bases because of their high speed and because of the large number of airfields in existence in the western parts of Germany.

With the distance by air being only 180 miles from Hamburg to Dortmund and 180 miles from Stuttgart to Dortmund, it was possible to develop areas of main defense by moving forces from the flanks to the center or from the center to the flanks at any moment if the units took off early enough.

Even for the units stationed in the Berlin region, Heligoland Bight, the Ruhr region, and the Frankfurt area were just within striking range.

However, these possibilities are mere hypothetical conjectures. The conduct of air defense operations was in the hands of the various air district headquarters. As

previously described, these commands were governed by the 1939 combat directives which restricted them firmly to the defense of specific targets or target areas, so that it is doubtful that they could have reached any decision involving such flexible operations.

The decision to commit fighter forces from one air district command against an enemy penetration in another command area could only be taken at the next higher level of command, the air fleet, and for one air fleet to commit its forces in the command zone of another air fleet even required approval from the highest level, from the Commander in Chief of the Luftwaffe himself.

In view of the small forward reporting areas and, as already related, the complicated and time-consuming reporting methods of the radio intercept services, it is highly doubtful that at any time, if Germany's western opponents had launched a massed air attack directed against the industrial regions of Western Germany, to issue the appropriate operational orders for the fighter and twin-engine fighter units stationed far from the target area of the enemy attack.

However, the estimated strength of the western bomber forces, comprising approximately 500 bombers of the Royal Air Force and 490 of the French air forces, gave no cause for great anxiety on this score. The limitations to

which bombing tactics and techniques were still subject at the outbreak of the war gave no cause to expect attacks by bomber forces of a size which only became possible during the war.

Against bomber forces in the strengths then possible it could definitely be assumed that a force of 150 fighters such as that which the existing disposition made possible at any point along the west front within a very short time, would be amply sufficient defense.

The antiaircraft artillery arm, in compliance with mobilization plans, immediately upon mobilization activated between three and four mobilization type units for every regular peacetime units in existence. Within a few weeks after mobilization the arm thus had a personnel strength of approximately 425 000, over four times its peacetime strength. The almost negligible air activities of Germany's western opponents over German territory during the first few weeks of the war allowed the antiaircraft artillery arm ample time to remedy without interference the training defects in its reserve personnel newly inducted.

After completion of the activation of mobilization type units, the overall strength of the antiaircraft artillery arm in September 1939 amounted to 650 heavy and 560 medium and light antiaircraft gun

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batteries plus 188 searchlight batteries.

Owing to the lack of detail records on the subject it is not possible to compute the strength of the forces available for the defense in the West after September 1939.¹⁸⁰

The first available authentic source on the distribution of forces is a situation map dated 31 July 1940, which can serve as a guide, since it represents the final strengths after the mobilization type units had been activated and since no further activations took place until after August 1940.^{181.}

In 1940 the number of antiaircraft units available for home air defense was reduced by the establishment of antiaircraft artillery corps and because of the transfer of forces to the occupied territories of Western Europe. However, the effects of this reduction were hardly felt in the western home air defense areas, since the most of the units transferred were taken from air district commands deeper inside of Germany.

179. Source 103.

180. Source 104.

181. Sources 105, 106.

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According to the situation map maintained at Headquarters of the Commander in Chief of the Luftwaffe, status on 31 July 1941, the disposition of antiaircraft artillery forces was as follows:

		Heavy Bttrs	Medium & Light Bttrs	Search- light Bttrs
1.	Air District Command XI, Hanover	105	94	38
2.	" " " VI, Muenster	141	92	35
3.	" " " XII, Wiesbaden	65	60	25
4.	" " " VII, Munich	<u>36</u>	<u>40</u>	<u>7</u>
	Totals	347	286	105
				183

Local control of the antiaircraft artillery forces of all types was a responsibility of the Air Defense Commands, namely, the Antiaircraft Artillery Groups (with regimental status), and the Antiaircraft Artillery Subgroups (battalion status), and forces were assigned to these headquarters in accordance with the size and importance of the assigned defense targets and the degree of their vulnerability to air attack.

On the whole it can be said of the results achieved in the activation of mobilization types of antiaircraft artillery, that the performances of the peacetime units, the recruiting centers, the industry, and the administrative authorities must be considered outstanding. With very few exceptions all points of the planned program were fulfilled.

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The target set for heavy batteries was passed, but the number of 20-mm gun batteries and searchlight batteries was not quite achieved.

Both quantitatively and qualitatively the antiaircraft artillery arm in every respect was in the position to perform its missions in the air situation as it existed at the beginning of the war.¹⁸⁴

183. Source 107.

184. Source 65.

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The Aircraft Reporting Service was activated at mobilization in line with the peacetime preparations.

The air observation posts, air observation centers, aircraft reporting centers, the latter at headquarters of the various air district commands, were manned by the reserve personnel earmarked for these duties, and the established telephone system was linked up by the postal authorities.

The antiaircraft artillery and fighter command posts were given their prescribed lines to their nearest air observation centers and aircraft reporting centers at the appropriate air district headquarters.

A command network of wire communications prepared for the purpose in peace was connected, and an emergency radio network established by the Air Signal Corps against the eventuality of a failure of wire communications was placed in operation.

This insured the proper functioning of the active forces of the air defense system, the fighter and antiaircraft artillery arms and the aircraft reporting system.

AIR DEFENSE COMMAND SYSTEM IN THE WEST

Technically, the air district commands were the headquarters controlling the operations of the forces of air defense quoted above. As previously described, control

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over the fighter and antiaircraft artillery forces assigned in areas of main effort was consolidated under Air Defense Commands, local headquarters under the appropriate Air District Commands.

In addition to the existing Air Defense Commands 1, 2, 3, and 4, at Berlin, Leipzig, Hamburg, and Duesseldorf, respectively, Air Defense Command 5, Frankfurt on Main, was established on 1 October 1939. Up to 1 July 1939 Air Defense Command 6, at the time designated as Air Defense Command 2, was at Stettin, while the Leipzig command was originally designated with the digit "2." It has also been mentioned previously in this study that the measure placing fighter units under the air defense commands did not prove a sound one.

This is best illustrated by the experience of the Commanding Officer, 3d Fighter Wing, who, together with his units, was placed under Air Defense Command 2, Leipzig: On reporting to his new superior officer, a colonel of antiaircraft artillery, the latter informed him quite frankly that he knew nothing of fighter operations and that it would be best for the wing commander to order the operations of his units as he himself considered wisest.

The fighter command in Heligoland Bight, under the Commanding Officer, 26th Twin-Engine Fighter Wing, also

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was not placed under Air Defense Command 3, Hamburg, as it should have been according to the general directives given, but directly under Air District Command XI, Hanover, instead.

The reason for this deviation from general directives may have been the fact that the main area in which the fighter and twin-engine fighter units would have to operate was the North Sea, since the majority of them were stationed close to the coastline, with elements stationed on the North Sea Islands, whereas the Luftwaffe antiaircraft artillery units, because of the commitment of naval antiaircraft artillery forces in the coastal areas, were deployed farther inland. For this reason to have placed the fighter units under Air Defense Command, Hamburg, would have been highly impracticable.¹⁸⁶

These confusing circumstances were probably the grounds for a renewed order by the Commander in Chief of the Luftwaffe on 21 September 1939 clarifying the chains of command for the fighter forces.

185. Source 108.

186. Source 109.

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For the fighter forces the following changes in existing orders regulating chains of command will be placed in effect immediately:

1. Fighter units stationed within specific air defense command areas in local defense missions will be under the command of the appropriate Air Defense Command in whose areas they are stationed.
2. All other fighter forces will be under the immediate command of the appropriate air fleet headquarters, which, in turn, can assign them to their air divisions whenever necessary.
3. This order changes nothing in the status of air district command and defense matters controls.

The order quoted above was signed by the Chief of the Luftwaffe General Staff, General Jeschonnek.

It is an established fact, however, that the requirements of the order were not applied in the command area of Air District Command XI, which moved its headquarters from Hannover to Hamburg in November 1939, which itself retained control over the operations of its assigned fighter forces.

FIRST SUCCESS IN AIR DEFENSE

♦ SEPTEMBER 1939

Only one day after the declaration of war by Britain

187. Source 110.
188. Source 111.

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and France the air defense system in the West was to be called upon to prove its efficacy.

During daylight on 4 September 1939 the British Royal Air Forces started the first strategic mission of its bomber forces. Twenty Blenheim and Wellington bombers crossed the North Sea and the Bight of Heligoland to attack the battleship Scheer at Wilhelmhaven.
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Thanks to the timely warning received through the naval radar instruments stationed on the North Sea islands German interceptor fighters were able to take off in time for action, with the result that twelve of the attacking bombers, making more than 50 percent of the entire force,
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were shot down.

This successful defense action apparently sufficed to halt all intentions of the Western Allies to wage strategic air warfare for the time being and allowed the German air command time and opportunity to reinforce the air defenses in the West and improve the general standards of performance without interference.

REORGANIZATION OF AIR DEFENSES AFTER POLISH CAMPAIGN

After the end of the Polish Campaign a directive from the Commander in Chief of the Luftwaffe on 22 September 1939 ordered a changed disposition of the defensive air units

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deployed in the West, which brought an important change
in the command set up of the fighter arm, as follows:

1. The fighter forces to remain in the Berlin-Central
Germany regions (2d Fighter Wing HQ with its 1st Group
and the¹ 1st Group, 20th Fighter Wing, and 3d Wing HQ
with its 1st Group) were placed under Air Defense Com-
mand 1 (Berlin) and 2 (Leipzig), respectively.

2. All other fighter and twin-engine fighter units
were allocated to the various air fleet headquarters
and assigned by them to their air divisions.

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189. Source 112.
190. Source 113.
191. Source 80.

This measure is linked directly with the strategic concept for the continued conduct of air warfare.

The directive from the Commander in Chief of the Luftwaffe on 23 September 1939 governing the conduct of operations in the West emphasizes the requirement for general restraint in the field of strategic air warfare.

Second Air Fleet was to prepare for concentrated attacks attacks against London and Liverpool to be launched only in the event of British air attacks against the German civilian population.¹⁹²

Retaliatory attacks of this type were in accordance with the regulations contained in the manual THE CONDUCT OF AIR OPERATIONS, PARAGRAPH 191 which, as previously explained provided for this kind of reaction to intimidation attacks against the civilian population.

In accordance with the mentality of the Luftwaffe Command, which was directed toward the execution of swift attack it was only logical that the fighter and twin-engine fighter forces therefore were assigned to the commands responsible for purely strategic missions of this kind, namely, the air divisions, since they were an important element required in the execution of such missions.

Furthermore, overall responsibility for air defense

192. Source 115.

had always been with the air fleets within their zones of command anyway, just as they had overall responsibility for the conduct of offensive operations by the forces they controlled.

However, the circumstances logically developing from the measures taken could not be considered practicable and soon revealed a series of difficulties:

1. As a result of the purpose for which they had been established during times of peace, the air division command staffs were organized for the employment of reconnaissance, bomber, and dive-bomber forces in strategic operations and had no practical experience in the commitment of fighter and twin-engine fighter forces in air defense missions.

Being organized in consonance with their specific missions, the composition of these staffs was not appropriate for the conduct of air defense operations uninterruptedly over a long period of time by day and by night.

2. The coordination of fighter and antiaircraft artillery operations was only possible at air fleet level, and was therefore a complicated and time-consuming matter.

The two air fleet headquarters committed in the West

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did not adopt uniform solutions to cope with this dilemma.

In the zone of the Second Air Fleet Colonel von Doering

in command of the 26th Twin-Engine Fighter Wing, was as-

signed in November 1939 to direct the operations of all

fighter and twin-engine fighter forces within the command.

He established his first headquarters at Dortmund, the

26th
peacetime garrison of the ²Twin-Engine Wing.

On 1 January 1940 the position thus created was au-

thorized under the designation of CO, Fighter Command (Jagd-

Fliegerführer) with the rank of brigadier general, and

Colonel von Doering was appointed officially as CO, 2d

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Fighter Command.

The 2d Fighter Command was responsible exclusively
for the direction of the tactical operations of the assign-
ed fighter and twin-engine fighter forces both in air de-
fense and air attack missions.

The Heligoland Bight area was excluded from control

193. Source 109.

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by the 2d Fighter Command. Here, Lieutenant Colonel Schumacher, commander of the 1st Fighter Wing established in November 1939 was appointed officially as the commanding officer of fighter forces in Air District XI to control all fighter and twin-engine fighter operations, and all such units were placed under the headquarters of the 1st

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Fighter Wing.

The fighter and twin-engine fighter units assigned tactically to the 2d Fighter Command remained in other respects under the air divisions to which they had been allocated.

The special arrangement made for Heligoland Bight was due in part to personality problems.

Lieutenant Colonel Schumacher had been a naval officer in World War I. During the build up of the new German military forces he was one of the officers originally intended for the new naval air forces.

As previously mentioned in this study the mission of air defense within the naval fortifications and coastal areas was a responsibility of the Navy, with its own anti-aircraft artillery forces. This lack of uniform control in air defense matters in regions near the coast came

194. Sources 109, 111.

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justifiable criticism by the Luftwaffe, which claimed that it should be in control. This unavoidably resulted in friction between the Navy and the Luftwaffe in the settlement of air defense problems.

Lieutenant Colonel Schuhmacher had good personal relations with his former comrades in the Navy. It was thought that his appointment to head the fighter command would serve to relieve some of the tension. This was a particularly important factor since success hinged in a decisive measure upon smooth cooperation between the Luftwaffe Fighter Command and the Naval Antiaircraft Artillery Command,

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whose zones of operations overlapped.

In the zone of the Third Air Fleet, the solutions initially adopted were different and less consistent:

I 1. All twin-engine fighter forces, were placed under the air divisions and were intended primarily for strategic missions in support of the bomber and reconnaissance forces. This included those units which still had only the combat value of normal fighter forces, namely, the 102d, 152d, and 176th Fighter Groups (also designated as the 1st Group, 2d, and 1st Group 52d, and 2d Group, 76th Twin Engine Fighter Wings, respectively).

2. The fighter forces stationed in the areas

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along the middle reaches of the Rhine River were placed under the air divisions, and were assigned tactically to the CO, 53d Fighter Wing, Wiesbaden, who thus officially functioned as the head of a fighter command.

It was only in February 1940 his position was authorized and he was given the official designation
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of CO, 3d Fighter Command.

3. The 52d Fighter Wing in the Mannheim region remained under Air District Command XIII, the 1st Group, 54th Fighter Wing and 2d Group 71st Fighter Wing (re-designated 2d Group, 51st Fighter Wing in December 1939) in the Stuttgart region under Air District Command VII.
198

4. With the establishment of 3d Fighter Command in February 1940 all fighter and twin-engine fighter units were assigned to this headquarters and remained under it in all respects up to the opening of the
199
western campaign.

195. Sources 111.

196. Sources 3, 100.

197. Sources 3, 116.

198. Source 117.

199. Source 116.

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It can thus be established here that, in spite of the clear-cut order of 21 September 1939, no clear cut-line of command existed in respect to the fighter and twin-engine fighter forces. This fact can be explained only by the mentality of the leading men of the times.

The Commander in Chief of the Luftwaffe himself, Field Marshal Goering, as a fighter pilot of World War I was averse to assigning responsibility for the operations of the fighter arm to the regional and district antiaircraft artillery commands. Practically all commanders of air district and air defense commands had come from the Army and the antiaircraft artillery arm.

As World War I air pilots Generals von Greim, Loerzer, and von Richthofen, commanding the 5th, 2d, and 8th Air Divisions, respectively, were far better qualified to control the operations of the fighter and twin-engine fighter forces than were the air district commanders and claimed such control, with which claim their commander in chief was in full sympathy.

That a command system so lacking in uniformity could continue to exist for such a relatively long time until the basic solution in the form of fighter commands was found in the autumn of 1939 was possible only because the small air activity of the western opponents did not make a

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quicker solution of the problem absolutely essential.

The reasons for the problem doubtlessly resided in the dual nature of the fighter arm as a weapon to be committed in support of strategic air operations and at the same time a weapon of air defense. It could be compared with a child who has two fathers and therefore no father at all.

A solution in favor of the offensive was adopted as soon as it became clear that the western opponents were not yet in any positions to wage strategic air warfare on any appreciable scale.

SUCCESSFUL DEFENSE OPERATION ON 18 DECEMBER 1939

The fact that the Western Allies were not yet able to wage large-scale strategic air warfare was realized largely as a result of the second victory of major proportions achieved by the German air defenses when a British bomber force attempted to attack the naval base at Wilhelmshaven on 18 December 1939.

In defensive operations directed by Lieutenant Colonel Schuhmacher, CO, Fighter Command Heligoland Bight, units of the 1st Fighter Wing shot down 34 of the attacking British Wellington bombers at a cost of only two fighters lost.

Here again the timely take off of the interceptor

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fighter forces was due to the reliable advance warnings received through the naval radar instruments and two Freya type radar stations of the Luftwaffe aircraft reporting services established on the island of Wangeroog.²⁰⁰

FIGHTER UNITS ACTIVATED AT MOBILIZATION

One consequence of the assignment of the fighter and twin-engine fighter forces to the air divisions and the resultant expansion of these headquarters was that they

were upgraded to air corps on 6 October 1939.²⁰¹

As previously related above inadequate personnel and materiel made it impossible to increase the overall strength of the existing fighter and twin-engine forces to the preplanned figures.

Measures were taken to achieve what was possible, and the form of these measures characterizes the existing difficulties.

200. Source 118.

201. Source 119.

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Pursuant to orders from the Commander in Chief of the Luftwaffe, effective 8 September 1939, the following new units were activated:

Parent Unit	Newly Activated	At
1st Group, 53d Fighter Wing	7th Squadron	Wiesbaden
2d " 53d " "	8th "	Mannheim-Sandhofen
1st " 26th " "	7th "	Cologne
2d " 26th " "	8th "	Duesseldorf

The orders mentioned in each case that the intention was to organize the group headquarters and their 9th Squadrons as soon as the necessary personnel and materiel became available.

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Pursuant to orders dated 21 September 1939 from the Commander in Chief of the Luftwaffe 27th Fighter Wing Headquarters was organized at Muenster-Loddenheide under the command of Lieutenant Colonel Ibel.

The new wing was assigned the following units:

1st Group, 3d Fighter Wing, redesignated as 1st Group 27th Fighter Wing, and, after the end of the Polish campaign the

1st Group, 1st Fighter Wing

1st Group, 21st " "

1st Group (of which the 1st Squadron was a fighter unit),

2d Training Wing.

At about the same time 77th Fighter Wing Headquarters

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was organized at Neumuenster under Lieutenant Colonel Man-teuffel and assigned the following units:

2d Group, 77th Fighter Wing and, after the end of the

Polish campaign the

101st Fighter Group (formerly 2d Group, 1st Twin-Engine
204
Fighter Wing).

The newly activated forces for the fighter arm under the mobilization plans thus did not amount to more than 2 wing headquarters and 4 squadrons of fighters.

No new twin-engine fighter units at all were activated at mobilization.

202. Sources 120, 121. 203. Sources 77, 91, 123.

204. Source 95.

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The actual possibility to mobilize 2 new wing headquarters and 4 new fighter squadrons compared with the required establishment at mobilization of 6 new wings and 24 fighter squadrons reveals clearly how little harmony existed between the political decisions taken and the practicability of military planning.

From the first day of the war on the fighter arm labored under improvisations, and this situation was to remain unchanged for the duration of the war.

THE NIGHT-FIGHTER ARM IN THE AUTUMN OF 1939

The month of October also brought an important decision in another field which was to prove a serious disadvantage later.

In a conference between the Commander in Chief of the Luftwaffe and the Chief, Fighter Inspectorate (Inspectorate 3), the establishment of a night fighter arm was discussed. The theoretical and practical groundwork for this purpose had already been done by the existing regular night fighter units, the 10th Squadron, 2d Fighter Wing, and 11th Squadron, Second Training Wing, both of them T/O units.

The situation created by the activities of the Western Allies up to October 1939 resulted in the consideration that there was no acute necessity to create a night fighter arm. It was decided therefore to refrain from building

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up the arm in excess of the existing experimental squadrons.

REINFORCEMENT OF THE DAYLIGHT FIGHTER FORCES IN 1939-40

It was considered more important to increase the number of daylight fighter units in existence. It is safe to assume that this decision was taken under a misconception of the threat of air attack at night and, after the astonishingly quick end of the Polish campaign and the complete consolidation of the frontiers in the East, under the premises of continued warfare free of any threat in the rear.

One plan was in existence providing for a blitz campaign against France, similar to that conducted in Poland, to commence already on 10 November 1939.

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In view of the significance of strong fighter and twin-engine forces, as evidenced in the Polish campaign, to achieve air supremacy as the means to bring a campaign to a speedy end it appeared highly important under the ruling aspects to create as speedily as possible conditions for the maintenance of air supremacy also over the opponents in the West.

All efforts were therefore made in the next few months to release personnel and materiel for the activation of fighter units.

As a result a start was made, after the 3d Groups of the 26th and 53d Fighter Wings had been brought up to

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full strength in November 1939, at organizing the new 3d Fighter wing with one group (1st Group, 3d Fighter Wing), and the 1st Fighter Wing, under Lieutenant Colonel Schuhmacher, to assume command over the fighter forces in the Bight of Heligoland in place of Colonel Doering, in command of the 26th Twin-Engine Fighter Wing.

These were followed by the activation of the 2d Group, 2d Fighter Wing and the 2d Group, 27th Fighter Wing in January; 54th Wing Headquarters, the 2d Group, 2d Fighter Wing, and the 2d ~~Wingup~~, 27th Fighter Wing in February; and the 4th Group, 2d Fighter Wing, and 3d Group, 3d Fighter Wing in March 1940.

206. Source 124.

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This series of activations came to a close in April with the establishment of the 51st Wing Headquarters which, curiously enough, was not assigned a single unit with its own designation number but three groups from three other wings, just as it will be noticed that all wings consisted of groups having different wing identification numbers. This can be taken as another sign of the improvisational nature of the expansion of the arm.

Altogether the mobilization forces it had proved possible to activate between September 1939 and May 1940 increased the strength of the fighting arm once again by 4 wing headquarters and 8 fighter groups, bringing the total strength of the arm up to 10 wing headquarters and 28 fighter groups.

With the exception of the 1st Group, 20th Fighter Wing, 207 all units were equipped with Me-109-E aircraft.

Their allocation for offense and defense will be dealt with later.

TWIN-ENGINE FIGHTER FORCES IN 1939-40

The measures directed at strengthening the twin-engine fighter forces /were designed to equip all existing units uniformly with Me-110 aircraft and not at increasing their number. This

207. Sources 18, 125, 126, 127.

245

program started in December 1939, when the 26th Twin-Engine Fighter Wing received its new aircraft and continued until all units had Me-110-C planes by April 1940. One complication developed here through the lack of DB-601-A engines, which were also required in the program to reequip normal fighter units with Me-109-E planes. As a result only Type Me-110-B planes powered by two Jumo-210 engines were available and these did not meet the requirements of modern air warfare. It was mid-January before the allocation of Me-110-C planes powered by two DB-601-A engines commenced and made it possible to place them in service in exchange for the outdated models currently in the units.

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The time left before the opening of the western campaign was extremely short for the twin-engine fighter forces to cope with all the problems involved in the changeover from Me-109 to Me-110 aircraft.

The organization of the twin-engine fighter forces differed considerably from that of the normal fighter arm. Whereas the organization of the normal fighter units was designed to enable them to operate from any usable airfield without non-organic technical, personnel, or materiel support, the twin-engine fighter units were organized similarly to the bomber forces for flexible operations. Each unit had only its flight personnel, a few key technicians, and a

208. Sources 128, 93.

246

bare minimum of servicing equipment intended for transportation by the transport aircraft organically assigned to each unit. To maintain their operability, the twin-engine fighter units, in equal measure with the bomber units, had to rely on the availability of airfield operating companies, which restricted them to the use of base airfields. This facilitated their quick long-distance transfer at a speed equivalent to that of bomber units and was a feature characteristic of their primary mission of strategic operations as escort units for the bomber forces.

For units still equipped with Me-109 planes the change-over to Me-110 planes thus necessitated a complete change of their technical services.

Retraining was also a large item, involving as it did a transition from handling a light single-engine plane to that of a heavy twin-engine plane, the techniques of flight in unit formation and radio controlled navigation, firing practice, and integration exercises to insure smooth collaboration between the pilot and the radio operator while in action.

That all these requirements could be fulfilled by the beginning of the western campaign on 10 May 1940 speaks well for the quality of the crews selected for the purpose.

In April 1940 the 2d Twin-Engine Fighter ^{Wing} Headquarters,

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under Lieutenant Colonel Vollbracht, was organized at Mannheim, and 76th Twin-Engine Fighter Wing Headquarters, under Major Grabmann, at Langendiebach, and the existing groups were redistributed.

The reequipment of the twin-engine fighter units with Me-110 planes completely terminated their use as defense fighters. One evident sign of this change was that these units were no longer required to maintain aircraft under standby alert for defense missions. On the other hand, they were employed on some occasions, within the scope of their strategic purpose, to escort reconnaissance planes operating over enemy territory. It was during a mission of this type than an incident occurred which was to prove of enormous importance for the fighter and twin-engine fighter forces.

It was in February 1940 and a squadron of Me-110-C had escorted a strategic reconnaissance plane as far as the Charleville area, where it encountered a British squadron of Hurricanes at an altitude of 26 000 feet and a temperature of -67 degrees Fahrenheit. The encounter produced no results on either side, because all weapons were frozen. This showed that the lubricating oil used by the Luftwaffe was not proof against freezing temperatures. Immediate tests revealed that the weapons oil used by the Army did

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not have this disadvantage, and a change was effected without delay.

AIR SITUATION IN THE WEST

January-May 1940

After the costly and unsuccessful attempt of the British to attack Wilhelmshaven on 18 December 1939 the air situation in the West was marked by the following features:

1. During daylight Germany's western opponents restricted their air activities to reconnaissance in the near border and North Sea coastal areas, plus air patrols maintained by fighters in the vicinity of the border.

2. A small percentage of the reconnaissance flights were carried out by armed bombers--exclusively British--which attacked targets such as outpost patrol boats off the shores of the North Sea and airfields close to the coast.

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3. Out of 9 penetrations by enemy aircraft in January 1940 3 were at night. In February the ratio of night to daylight penetrations was 13 to 3, in March 23 to 7, in April 22 to 0, and from 1 October 1940 on 3 out of every eight penetrations took place at night.

4. Penetrating units dropped bombs on two occasions in January 1940, on one occasion in February, on six in March, on seven in April, and on three occasions from 1 to 10 May. No serious damage resulted. On several occasions the planes dropped leaflets in foreign languages.

5. The main areas of penetration were northwestern Germany and the North Sea coastal areas.

The strain to which the German defense fighters were subjected was more in the nature of a sit-down warfare than in the form of combat operations. Having to rely exclusively on the vision and hearing of the personnel of the aircraft reporting service it was found exceptionally difficult to track the course of a reconnaissance plane at altitudes higher than 19 000 feet over the areas near the border closely enough to commit the alerted fighters properly against it.

Usually the fighters taking off on these fruitless missions exploited the opportunity to patrol challengingly

210. Source 129.

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just across the border, over enemy terrain, in search of "their" reconnaissance plane. British and French fighters obligingly took off to repel them and almost invariably were shot down by the Me-109 fighter from its advantageous position. Particularly those fighter pilots were successful in these ventures who were vastly superior to their opponents by reason of their combat experience in the Polish campaign and in the Condor Legion. By such means Captain Moelders, in command of the 3d Group, 53d Fighter Wing, for example, was able to add another 12 planes on the west front to his previous score of 14 shot down.
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Such proof of their superiority could not fail to influence views on the future role of the fighter forces.

THE ORGANIZATION OF ANTI AIRCRAFT ARTILLERY CORPS

IN 1939

The experience gained with the antiaircraft artillery and the important successes achieved by this arm in action against air and ground targets within the operations zones of the Army in the Polish campaign resulted in an entirely new organizational measure: the organization of antiaircraft artillery corps as a mobile reserve under the Commander in Chief of the Luftwaffe.

Two such corps headquarters were established on 28 No

211. Source 3.

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November 1939, the I under General Weise, and the II under General Desseloch. These corps will be referred to in this study as "Flak corps."

Each corps headquarters was assigned two to three anti-aircraft artillery regiments taken from practically all air district commands in existence.

The order authorizing the organization of the Flak corps headquarters established the following missions:

1. To establish and/or shift air defense concentrations in the operational sense; to provide antitank

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tank defenses on wide frontages;

2. To take action against enemy bunkers;

3. To provide support, including ground action,

in critical areas of combat;

4. To provide protection, subject to restriction

in area and time, for the foremost installations of the

ground service organization of the flying forces.

From this statement of missions alone it is obvious

that the consolidation of the antiaircraft artillery forces

in the form of motorized corps units was designed as a so-

lution for the mission of air defense in Army zones of ope-

rations, and as a means to exploit the advantage of the

armor piercing capabilities of the antiaircraft weapons

in action against enemy tanks and fortification works, with

main emphasis obviously on action against ground targets.

This concept of the use of Flak corps is even more

clearly evident in the wording of the mission letter for

the I Flak Corps, which was to participate in a frontal

attack against the Maginot Line on either side of the Saar

originally planned to open prior to 10 May 1940:

To protect the attacking Army units against high

and low altitude air attack, and to provide direct sup-

port in the attack through action to neutralize enemy

defense position systems and bunkers.

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In practise the execution of this mission required that the antiaircraft artillery units would have to move forward within the attacking Army units. This was precisely the form of operations which had already proved so exceptionally successful in Spain and in the Polish campaign in the speedy crushing of local resistance.

When the planned offensive was postponed, the mission assigned the I Flak Corps remained unchanged for the future.

The two Flak corps were assigned directly to the Second and Third Air Fleets, which in turn assigned them at the opening of the campaign in the west to support Panzer Group* von Kleist and/or the Fourth and Sixth Armies, in whose zone the corps were committed.

This withdrew a large percentage of the antiaircraft artillery forces which, according to the revised edition of Paragraph 121 of THE CONDUCT OF AIR OPERATIONS, normally would have come under control by the tactical air support commands attached to army and army group headquarters from such control.

The advantages of the new solution are clearly evident:

1. The danger of any dissipation of forces is avoided.

2. The possibility of developing power concentrations in the operational sense is created.

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3. Optimum exploitation of the existing possibilities for action were insured most advantageously under the control of antiaircraft artillery command staffs.

4. The dual mission of action against air and ground targets presupposed that command personnel would also have Army experience. Most of the command personnel in the antiaircraft artillery came from the Army and thus had far more army experience than the air officers usually assigned to head the tactical air support commands attached to various army headquarters.

5. The Flak corps headquarters were not locally tied to any superior headquarters, had an independently functioning organic signal communications system, and thus could maintain very close contact with the spearhead units of attacking forces. This insured that the antiaircraft artillery units would keep pace with the spearheading panzer units.

213. Sources 132, 152.

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After final establishment the two Flak corps were
organized as follows, status as of December 1939:

HQ, I Flak Corps Commanding General General Weise

Chief of Staff

Colonel Schwabedissen
GSC

I01st HQ AAA Regt Commanding Officer Colonel Hintz

1st Battalion, 12th AAA Regiment

1st " 22d " "

1st " 51st " "

85th Light AAA Battalion

3d (Searchlight) Battalion, Hermann Goering Regiment.

HQ, I02d AAA Regiment Commanding Officer Lieutenant Col-
onel von Hippel

1st Battalion, 18th AAA Regiment

1st " 38th " "

2d " 38th " "

91st Light AAA Battalion

HQ, I04th AAA Regiment Commanding Officer Colonel Buffa

1st Battalion, 8th AAA Regiment

1st " 11th " "

2d " 11th " "

75th Light AAA Battalion

3d (Searchlight) Battalion, 9th (Condor Legion) Regiment.

I01st Air Signal Regiment, Commanding Officer Colonel Schuetzeck

1st Sup and Admin Staff, Commanding General Brigadier General von Mackensen

Air Liaison Squadron.

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HQ, II Flak Corps Commanding General General Dassloch

Chief of Staff Colonel Neuffert, GSC

HQ, 201st AAA Regiment Commanding Officer Lieutenant Colonel Poemer

1st (Composite) Battalion, 6th AAA Regiment

2d " " 26th " "

1st " " 64th " "

73d Light AAA Battalion

3d (Searchlight) Battalion, 33d AAA Regiment

HQ, 103d AAA Regiment Commanding Officer Colonel von Axthelm

1st (Composite) Battalion, General Goering Regiment

1st " " 7th AAA Regiment

2d " " 43d " "

4th (Light) AAA Battalion, Herman Goering Regiment.

102d Air Signal Regiment Commanding Officer Lieutenant Colonel Saul

2d Sup and Admin Staff Commanding General Brigadier General Seldner
214
Air Liaison Squadron (F1-156 Storch planes).

In the winter of 1939-40 and up to the opening of the campaign in the west the majority of the units of the Flak corps were committed in Air Defense Zone West, where they were prepared for their special mission of action against air and ground targets through systematic training and firing exercises.

Shortly before the western campaign elements of the

214. Sources 107, 181, 182.

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201st and General Goering AAA regiments were used to form a special groupment designated AAA Group Aldinger (Flakgruppe Aldinger) to provide artillery support for the airborne operation against Fort Eben Emael, near Luettich, planned as the start of the offensive.

AAA Group Aldinger consisted of 3 heavy antiaircraft artillery batteries (1st Battery, 6th AAA Regiment, 7th Battery, 43d AAA Regiment (General Goering), and 3d Battery, 64th AAA Regiment) plus 2 platoons of light antiaircraft guns from the 2d Battalion, 26th AAA Regiment.

This measure reveals with particular emphasis the high opinion held of the effectiveness of antiaircraft artillery fire to secure success in action to reduce strongly fortified positions on the ground.

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ANTIAIRCRAFT ARTILLERY AIR DEFENSE OPERATIONS

1939-40

The air situation in the winter of 1939-40 and in the spring of 1940 up to the opening of the campaign in the West was such that the antiaircraft artillery forces of the Luftwaffe had little opportunity to prove their capabilities in defense of the homeland.

The only two serious air attacks by sizable bomber units, on 4 September and 18 December 1939, had been repelled with resounding success by fighter forces of the

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of the Luftwaffe and antiaircraft artillery forces of the Navy.

No important experience could be gained as long as the western opponents confined their air activities to the dispatch of a reconnaissance plane to the coastal and near front areas every day or two.

However, attention apparently was given to the fact that the enemy carried out roughly one-third of his penetrations during the night.

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Source 132.

216. Source 129.

This circumstance served to focus attention on the problems of antiaircraft artillery fire at night with the optical instruments available at the time to air in finding a target.

As mentioned previously above, the Commander in Chief of the Luftwaffe in October 1939 had considered that no acute necessity existed to build up a night fighter arm and had given final orders that the fighter groups initially intended for night fighting missions were to remain with the daylight fighter forces. It was evidently thought that the use of searchlights to light up targets at night and the use of sound locators for aiming by sound would be adequate for defense against night attacks. Given weather conditions favorable for searchlight operations the risk involved could be accepted since the enemy bombers with their aiming devices based on the optical instruments then available also required equally favorable conditions of visibility to find their targets at night and attack it with aimed bombs.

The fact that the Luftwaffe nevertheless at an early stage initiated measures designed to replace optical aiming by radio locators which could provide reliable firing data for antiaircraft guns is a sign of wise and providential longsighted planning.

It has been related before in this study that the first model of a short range radio aircraft locator developed under a development contract awarded in 1937 was demonstrated before leading men of the German armed forces in August 1939, and that it operated on a 50-cm waveband, registered the distance and altitude of the located target, and had proved usable at ranges up to 15 miles.

This instrument was not assigned to the aircraft reporting services but in late 1939 was turned over to the antiaircraft artillery arm and installed in a battery position at Essen-Fintrop to test its usefulness in computing firing data for antiaircraft artillery units. Although it still lacked the most essential elements required by the antiaircraft artillery, since it still had no beam locator properties, the principles of the instrument proved highly useful. For the time being the lacking beam locator was replaced by a hand operated maximum locator. A three-man servicing team relayed the necessary altitude, lateral, and range data by means of a microphone to a fire-control director.

The Commander in Chief of the Luftwaffe gave orders for the procurement of 5 000 of these instruments of an improved, smaller model and with locator beam equipment.

The first instrument of this production series was deliver-

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delivered in May 1940* almost on the same day on which the Royal Air Force dispatched a force of Wellington bombers in the first air strike against the Ruhr region in a night attack.

The Royal Air Force operated generally on the principle of area bombing rather than precision bombing and very soon started night attacks even in weather conditions which made defense difficult because of poor visibility. The adoption of radio instead of optical locating of targets by the antiaircraft artillery was therefore to play a decisive role in air defense.
217

At the beginning of the war the following tactical requirements had been stated for the antiaircraft artillery:

217. Sources 22, 45, 112.

* This was the Wuerzburg radar.

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1. The objective in antiaircraft artillery air defense operations is to shoot down enemy aircraft before they reach the bombing run zone, or at least interfere with the operations of the enemy force to such an extent as to make aimed bombing impossible.

2. As a basis it is assumed that the targets for antiaircraft artillery fire will be at altitudes of up to 16,500 feet and will travel at speeds of up to 110 yards per second or 220 miles per hour, during daylight and at night.

3. Efforts must be made to provide a triple overlap of antiaircraft fire, so that each enemy plane will be exposed to fire from three heavy batteries at least at any point over the target area.

The only aircraft which had to be reckoned with as suitable for strategic bombing operations were the British Hampden and Wellington bombers, and their speed was far less than the stated assumed speed performance of attacking aircraft.

With a total strength of 650 heavy batteries at the end of 1939 the requirement of a triple overlap of defensive fire could be met in the case of more than 100 defense targets throughout Germany.

The accuracy of fire of the 88-mm guns against planes

218. Source 114. 219 Source 133.

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traveling at the speeds achievable at the time had been demonstrated in firing practice and in actual combat in Spain.

Although the air situation resulting from the air activities of Germany's western opponents in 1939 and 1940 up to the beginning of the campaign in the west had not as yet put Germany's air defenses to any real test, the Luftwaffe had no reasons to doubt that, under the given and

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Photo

88-mm AAA gun (motorized) on the march

Photo

88-mm AA gun (motorized) being placed in position

257b

Photo

88-mm AA gun in position ready for action

Photo

Range finder for heavy AAA

257d

Photo

Light 20-mm AA gun in firing position

Photo

Range finder for light 20-mm AAA

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Photo

37-mm medium AA gun in firing position

THIS PAGE DECLASSIFIED IAW EO12958

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Photo

AAA Sound Locator

Used to direct Searchlight beam and for
firing by sound

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known circumstances of the times everything possible had been done in the field of antiaircraft artillery to insure successful defense against air attack during daylight and
220
at night.

AIRCRAFT REPORTING SERVICES IN 1939-40

The small air activities during the period from the outbreak of the war up to the spring of 1940 also did little to promote development of the aircraft reporting services, improve training standards in aircraft recognition, or test the functioning of the service as a whole and of the reporting organization in particular under conditions of actual war.

As previously mentioned, the chief problem was that of identifying friendly and enemy aircraft. To facilitate matters in this respect special measures were introduced at the beginning of the war to regulate friendly air traffic. These measures were published by the Commander in Chief of the Luftwaffe on 19 September 1939 under the title REGULATIONS FOR AIR TRAFFIC AND AIR DEFENSE (Bestimmungen über Flugbetrieb und Luftverteidigung) and contain-

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ed the following instructions:

I. Regulations for Air Traffic.

1. These regulations are intended for current and repeated instruction of all pertinent crews and

servicing personnel in the offensive and defensive air forces as well as for aircraft crews assigned to schools, supply installations, transport units, and courier squadrons, and of air traffic supervisory personnel.

2. The entire territory of Germany has been declared as closed to air traffic for all aircraft not in the services of the German Government or military forces. Special approval is required for air traffic of any sort.

3. Furthermore, to secure air traffic and facilitate air defense certain areas are also declared closed to aircraft of the German Government and military forces, and specific approach and departure lanes have been prescribed for certain airfields.

4. In the case of military closed air traffic areas, which are ordered by the Commander in Chief of the Luftwaffe, there are two types of areas

a. areas in which a warning will precede weapons fire to enforce these regulations,

b. areas in which fire may be opened without warning.

In exceptional circumstances the appropriate air district commands may permit aircraft to cross such closed areas.

5. Military and Government aircraft are ordered, as far as their current mission permits,

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- a. to bypass areas protected by antiaircraft artillery, and military firing ranges and training grounds;
- b. when flying by ground orientation to maintain a minimum altitude between 860 and 1 600 feet;
- c. to burn position lights at night;
- d. to detour warships as widely as possible, since naval ships when at sea open fire on principle without prior warning.

6. For instruction by schools of the Luftwaffe and for training flights the use of the following areas is authorized:

German territory east of a line extending from Luebeck-Lueneburg-Hannover-Kassel-Wuerzburg-Noerdingen-Immenstadt, including occupied Poland to a line extending from Mlava-Lodz-Maehrisch Ostrau.

7. For civil aviation activities (testing grounds, National Socialist Aviation Corps, commercial aviation, regular air lines) use of the following areas is authorized:

Eastern boundary: Lebasee-Rummelsburg-Deutsch Krone-Landsberg-Reppen-Liegnitz-Maehrisch Ostrau-Vienna-Wiener Neustadt-Graz-railroad from Marburg to the German border.

Western boundary: Stade-western outskirts of

260 a

Bremen-Weser River up to Verden-Korbach/Waldeck-

Fulda-Wuerzburg-Noerdingen-Memmingen-Sigmaringen-

Constance.

Night aviation is prohibited throughout German territories. Exceptions will be handled by the air district commands.

Test and acceptance flights will be restricted to specified "air base zones."

II. Regulations for Air Defense.

1. Antiaircraft Artillery.

a. Within Army zones of operations and within the zone of interior immediate fire is authorized against all targets identified as enemy aircraft.

Warning fire will be delivered against all aircraft which might be hostile over closed areas. If the plane does not leave the area immediately it will be taken under effective fire without further warning.

b. In areas in which effective fire is prescribed without warning, fire for effect will be opened against all aircraft not clearly identifiable as German. Warning shots will be fired against aircraft identified as German.

c. Aircraft with position lights at night will be lit up by searchlights.

2. Fighter Forces. In the execution of combat missions fighter pilots are not restricted to any specific route or altitude.

The crossing of closed areas by fighter units on missions is arranged by special regulations for the coordinated action of fighter and antiaircraft artillery forces.

Special arrangements will also be made for coordinated action between fighters and antiaircraft guns mounted on warships within military closed areas and naval fortifications areas.

Section III establishes the air traffic closed areas with and without warning fire, and special lanes of approach

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and departure to the air district command areas.

The areas in which effective fire was not to be delivered without warning were as follows:

Within zone of Air District Command XI: 1. Western outskirts of Wesermuende-Jade (city)-Fangerooge.

2. A radius of 9 miles from the center of Kiel

3. A radius of 12 miles from the center of Hamburg.

4. A radius of 6 miles from the locks at Brunsbuettelkoog.

Within zone of Air District Command VI: Within a boundary extending from Wesel-Hamm-Bonn-Muenchen Gladbach.

Within zone of Air District Commands XIII, VII, and XIII: Daily from one hour after sunset to sunrise the areas west of a line extending from Kassel-Coburg-Bad Aibling.

This regulation of air traffic over German territory insured that in all areas open to threat by western air forces with their current penetration ranges traffic by German aircraft was strongly reduced and that air traffic over closed air traffic areas would be restricted to fighter aircraft on current missions.

Furthermore, all flights outside of the areas authorized for aviation training had to be reported in advance.

The local air police or other air traffic control authorities were required to report each flight 30 minutes

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before take off, stating the type of aircraft, take-off time, route and altitude, to the next air observation post.

At these posts special air situation maps were maintained showing the movements of friendly aircraft.

The air observers themselves were not informed but were encouraged to report every aircraft seen or heard.

At the air observation post it was decided after an examination of the Air Situation Map of Friendly Aircraft Movements whether the aircraft so reported was to be reported to the center as hostile.

This basic regulation appeared the best arrangement to insure constant alertness on the part of air observers and to train them in the recognition of aircraft by sight and sound. Many difficulties were encountered in this field, a few of which now follow:

a. Weather conditions and technical failures frequently delayed intended and reported departures, and the reports on the changed time of take off arrived too late and caused confusion;

b. Weather conditions or faulty orientation frequently resulted in a plane leaving its reported course;

c. Aircraft landed at fields other than their reported destination due to causes such as inadequate fuel, weather conditions, faulty orientation, or change of

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mind while en route;

d. If the route crossed the areas of a number of air observation posts the flight report had to be transmitted to each of them. Transmission of the report frequently took up more time than the flight itself;

e. Position posting was difficult in the case of friendly aircraft because their actual speed under the influences of wind and the route taken was an unknown factor and could only be estimated.

Owing to the quick activation of numerous new units after the outbreak of war, the training activities and flights carried out by front line units increased considerably. For this reason it was impossible to avoid the occasional case of a hostile reconnaissance plane entering the western areas being only incompletely tracked in the areas of friendly air traffic although it had been spotted while crossing the border.

Apart from the measures to restrict the number of aircraft in operation, efforts were also made to solve the problem of aircraft identification through appropriate training.

As previously related above, the large number of various friendly and enemy aircraft types in existence had given rise to the idea of producing miniature models of the more important military types of aircraft as visual aids in

22. Source 3.

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the training of aircraft spotting personnel.

The set of thirty miniature models of German, French and British aircraft delivered in December 1939 was approved and orders were issued to introduce these models.

A series of training courses was initiated in 1940 to which each motorized aircraft reporting company/^{and each} aircraft reporting reserve company was to detach four officers as well as 4 noncommissioned officers considered suitable as auxiliary instructors. In these courses instruction was given on the subject of aircraft identification, the previously referred to Aircraft Identification Volume and the miniature aircraft models being used as visual aids.

The personnel thus trained commenced giving instructions within their companies in February 1940, by which time the first deliveries of the miniature models had arrived. On 1 April 1940 a special Aircraft Reporting Service Training Regiment was established with the mission of centralized training for air observer teams in the subject of aircraft identification. This training was given in continuing courses.

Another step taken to improve identification techniques was the issue of blueprints for the construction of aircraft models with a scale of 1:50 to the air observers, who were then required to themselves construct models

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of the various types of aircraft. This method proved particularly effective, since the construction required close attention to the details of each type, and since personnel usually handled the models they themselves had constructed more carefully than those issued to them.

Finally, attention was devoted to the practicability of the required installations, particularly the observer post structures. Here it was found that, in order to obtain good listening results the air within the structure must be so still, even during heavy winds, that a match could burn.

Similarly to the Air Signal Corps, the antiaircraft artillery also took steps to improve aircraft identification. Training in this subject was given to antiaircraft personnel in the antiaircraft artillery schools. Close contact was maintained between the Air Signal Corps and the antiaircraft artillery in this field and all experience on the subject was exchanged.

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On the whole it can be said that the full import of the problems of aircraft reporting was clearly recognized and that everything possible was done to improve and raise the standards of the service.

As has been pointed out the air situation in the west from the outbreak of the war to the spring of 1940 was such that it placed no severe strain on the aircraft reporting

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services and could not reveal any defects in the system or weak points in its functioning. The Luftwaffe Command therefore had good cause to assume that the aircraft reporting services, as part of the entire home air defense system, would also be able to meet all requirements when the time came.

The motorized aircraft reporting companies of the Air Signal Corps must be considered a separate subject in the field of aircraft reporting.

As previously said, these units were organized from regular personnel of the Air Signal Corps, were fully motorized, and, if German forces moved into enemy territory, were to extend the aircraft reporting network right up to the front lines.

223. Source 7.

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Plans provided for each air district signal battalion to have a motorized aircraft reporting company as its 4th Company, but this target was only reached in the spring of 1940.

At mobilization a II Air District Signal Battalion was activated in each air district command. The 5th Company in each of these battalions was a motorized aircraft reporting company.

By the spring of 1940 10 air district commands thus had 20 motorized aircraft reporting companies ready for operations.

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In the new field of radio locating it has been mentioned previously that the Wuerzburg A radar, an instrument for locating aircraft at short distances and originally developed for the aircraft reporting services, had been turned over to the antiaircraft artillery arm.

Since the end of 1938 the Air Signal Corps had one Freya radar instrument, of the same type as those supplied and installed on the North Sea islands, to the Navy, in its supply and training regiment at Koethen.

At the beginning of the war this instrument happened to be in the workshops of the manufacturing firm of GEMA, for repairs to its mounting. On 20 September it was

224. Source 7.

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installed on a 16-foot tower at Ploetzin, west of Berlin.

One month later, by 20 October 1939, the Air Signal Corps had three Freya radar instruments in operation, one at Trier (Welschbelling), and two on the island of Wangeroog, one of the latter having been transferred from Ploetzin.

On 16 December 1939 the Air Signal Corps received a fourth Freya radar instrument, which was installed on Hauberg mountain near Landstuhl in the Palatinate and assigned to the 6th (Motorized Aircraft Reporting) Company of the 12th Air Signal Regiment.

Another three instruments received on 1 January 1940 were installed, one each, on Kandel Mountain in the Black Forest, north of Freiburg, on Heinsberg Hill, north of Aachen, and in the Reichswald Forest at Kleve.

In February another Freya instrument was installed at Vilsum and a month later another was installed at Stadt-kyll in the northern Eifel (Schneeschifel) mountains. At the same time a second instrument was placed together with the first one installed there in the position at Landstuhl in the Palatinate, being taken from Kandel Mountain for the purpose.

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Altogether the Luftwaffe thus had 9 Freya radar instruments in operation in the West by the spring of 1940, all of them allocated to the aircraft reporting services.

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These instruments could cover the following areas in a depth of approximately 60 to 72 miles:

1. From Wangeroog the coastal areas of the Bight of Heligoland.
2. The Kleve/Rhine area, being the outpost area forward from the Ruhr region in the north.
3. The Aachen area, being the forward outpost area south of the Ruhr region.
4. The northern Eifel mountains (Stadt Kyll), being the outpost area forward of the northern sector of the middle reaches of the Rhine River.
5. The Landstuhl area, being the outpost area of the southern reaches of the Rhine, and the Frankfurt and Mannheim industrial regions.

A gap existed between areas 1 and 2, above, in the vicinity of the Dutch border east of Groningen to east of Zwolle. In all other areas the zones of possible radar observation overlapped.

225. Source 7.

For the time being the gap which existed in the radar chain was no cause for serious concern since it was not to be expected that the Western Allies would infringe Dutch neutrality too lightly.

The salient features in the aircraft reporting services as they developed from the outbreak of war to the spring of 1940 are thus as follows:

1. The organization and the standards of performance based on visual and oral observation were improved by means of purposeful measures and methods of training.

2. The activation of motorized aircraft reporting Corps companies organic to the Air Signal/insured mobile operations and reporting channels independent of wire communications.

3. The number of radar instruments serving to keep under observation the outpost areas of the main western air defense areas was increased. These areas were the Bight of Heligoland, the Ruhr region and the regions along the middle reaches of the Rhine River. The network thus established could be considered adequate for entire frontage in the West. Although this new system of mechanical observation was still in the process of development and only in the initial stages of practical experience. it could be assumed from events

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in the Bight of Heligoland on 18 December 1939 that no hostile bomber force could penetrate into Germany without being detected by the radar instruments in service.

The big advantage of the new system was that, with instruments stationed near the frontiers it was possible to extend observation much farther into enemy territory than could ever be done by means of vision and hearing alone.

STAGES OF ALERT FOR FIGHTER UNITS IN 1940

To insure that fighter units would be ready for defensive action immediately on call, a generally valid system of stages of alert had to be established.

Initially three stages were carried over from peacetime practices: "Rest," "Take Off Alert," and "Sitting Alert".

In the "Rest" stage units had to be ready to take off within two hours; in the "Take-Off" stage within five minutes; in the "Sitting Alert" within one minute.

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In an order by the Commander in Chief of the Luftwaffe dated 15 February 1940 a new alert system was established. The order contained the following requirements:

1. Alert duties must be carried out just as conscientiously as guard duties.

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2. It is necessary to differentiate between the following stages:

Take-off alert Alert stage 1

Stand-by alert " " 2

General alert " " 3

Reast.

3. Units under Alert Stage 1 and 2 have the mission of action against reported enemy penetrations.

Units under Alert Stage 3 must be ready to take the place of Alert Stage 1 and 2 within two hours.

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4. Under Alert Stage 1 unit personnel will do nothing but maintain readiness for an immediate take-off. All other activities will cease.

Under Alert Stage 2 unit personnel may continue training and, to a limited extent, servicing activities, or may rest.

Under the Rest Stage units are not intended for immediate commitment. Neither in point of strength nor of time may they be counted on for action.

5. In accordance with the current air situation and weather conditions the command responsible for air defense will order from case to case the size of the units to be held under the various stages of alert.

6. Units under Alert Stage 1 must be ready to take off within three minutes, units under Alert Stage 2 within fifteen minutes.

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AIR DEFENSE SITUATION IN SPRING 1940

In an overall review of the air defense situation for Germany in the spring of 1940 the following can be established:

1. In Germany's rear, in the East, no threat existed after the occupation of Poland and in view of the pact with the Soviet Union and the insignificant

227. Source 151

air power of the still neutral Balkan States.

2. The possibility of a threat from the South, from Italy, could be discounted because of the very friendly relations between Mussolini and Hitler.

3. Switzerland was traditionally neutral and could be counted on to remain so.

4. From Skandinavia there was still a gap through Norway and Denmark which the Western Powers under given circumstances might use as an approach route.

However, in view of the armament status of France and Britain compared with German strengths on the ground, at sea, and in the air, this possibility could not be considered as an acute threat.

5. The fighter and antiaircraft defense in Germany had been built up in such strength and equipped with such modern weapons that a considerable potential of advantage existed over the offensive air forces of Germany's western opponents.

6. A soundly organized and modernly equipped aircraft reporting service insured that the air defense system would function smoothly and in time when required.

7. The Westwall and Air Defense Zone West represented a strong shield preventing the western enemy

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from taking the initiative in any possible form.

From the viewpoint of this appraisal of the military situation it is selfunderstood that any logical planning for the continued conduct of the war must provide for the removal of the only flank threat still existing, north of Germany, before the territories involved were seized by the enemy.

OPERATIONS AGAINST DENMARK AND NORWAY

Military operations to occupy Denmark and Norway commenced on 9 April 1940 with support from Luftwaffe units under the X Air Corps.

For this purpose the X Air Corps was assigned 10 bomber groups, 1 dive-bomber group, 1 coastal patrol group, and 2 twin-engines fighter groups (the 1st Group each of the 76th and 1st Wings), plus 1 fighter group

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and 14 air transport groups.

The missions assigned the air corps were

1. To seize all important military bases through

a large-scale air operation;

2. To attack the British North Sea Fleet and pre-

vent any sizable enemy attempts to land troops in

Scandinavia.

3. To support and supply the ground and naval

forces committed in the operation.

The resistance offered by the insignificant air

forces available to Denmark and Norway could be counted

as negligible. Because of the weak position of the

British in point of air armament and because of the long

distance from British air bases, the Royal Air Force

at this juncture was also unable to interfere seriously

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with the German air operations involved.

This explains the fact that the defensive air for-

ces, in the form of twin-engine fighters and fighter

units, assigned to provide air protection during the

operation were so weak. Their initial mission was to

protect the bomber forces which would operate from air-

fields seized swiftly in Denmark and Norway. After first

moving forward to Danish airfields at Esbjerg, Kopen-

hagen-Kastrup, and Aalborg the 2d Group, 77th Fighter

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Wing and the 1st Group, 76th Twin-Engine Fighter Wing provided cover for the paratroopers and air-carried infantry landing on the airfields in southern Norway in the Oslo-Fornesby region (with air cover from the twin-engine fighter group) and on airfields at Kristiansand (with air cover from the fighter group), and then proceeded to land on the newly captured airfields as soon these were cleared and occupied by the airborne troops.

228. Source 130.

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This again is a classical example of the offensive solution for a defensive mission in a strategic operation and undoubtedly served to support the conviction that any undertaking simply must succeed under the protection of fighters and twin-engine fighters, since these with their enormous fire power could neutralize all resistance both in the air and on the ground.

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From the antiaircraft artillery arm of the Luftwaffe four composite battalions were attached to the Army forces in the operations to occupy Denmark and Norway. These included also a composite battalion and a motorized infantry battalion attached by the Luftwaffe to the Army forces from the General Goering Regiment, committed specifically under the X Air Corps to protect forward airfields in Denmark. Since practically no resistance was encountered by the German forces, the antiaircraft artillery units found no opportunity to distinguish themselves in action, and immediately after the military operations were relieved by reserve and naval antiaircraft battalions and returned to the zone of interior.

A "Special Air District Command" (Feldluftgau) was established in Oslo for Norway, and was assigned the mission of air defense in south and western Norway.

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Besides 4-5 antiaircraft artillery battalions, the

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Special Air District Command had available for this purpose the 2d Group, 77th Fighter Wing stationed on tactical airfields at Kristiansand and Stavanger. The two twin-engine groups were returned to the zone of interior.

The 1st Squadron, 186th Fighter Wing was stationed temporarily at Drontheim. In April 1940, after elements of the 2d Group, 77th Fighter Wing stationed themselves at Drontheim instead of the 1st Group, 76th Twin-Engine Fighter Wing, the squadron displaced to the 2d Group, 186th Fighter Wing at Aalborg after a brief stopover at
231 Kristiansand.

229. Sources 95, 130. 230. Source 135.

231. Sources 136, 137.

PREPARATIONS FOR THE OFFENSIVE IN THE WEST

Although the battle for Narvik was still in progress the German Joint Command (Wehrmachtfuehrung) turned its attention to the strategic objectives in the West with remarkable alacrity. Within a few weeks the Luftwaffe units were reorganized and distributed in accordance with plans for the campaign against France.

In view of past experience and because of the lack of adequate forces, there seemed only one way to achieve success. This was the unconditional commitment of all fighter and twin-engine fighter forces, plus the antiaircraft artillery in the two Flak corps, in operational action, leaving home air defense to the rest of the available antiaircraft forces.

All twin-engine fighter units, without exception, were assigned to the air corps for exclusive use in escort missions protecting bomber units.

The fighter units were consolidated under Fighter Commands 2 and 3 of the Second and Third Air Fleets, respectively, and had the dual mission of air defense within the zones of operations of the Army and of providing escorts for bomber, dive-bombers, and airborne forces within their range capabilities.

The motorized aircraft reporting companies were

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so stationed that they could follow immediately behind the spearheading forces of the Army and transmit information by radio to their own reporting centers, which in turn were connected with the nearest air observation post in the zone of interior.

This reveals the basic intention to move the protective belt of mobile air defense forces, the fighter and motorized antiaircraft artillery units, as far forward from German territory into enemy terrain as possible.

THE BUILD UP OF FIGHTER AND ANTIAIRCRAFT ARTILLERY FORCES IN 1939-40

In an examination to determine the basic views and basic planning for air defense it is also very revealing to consider the current and planned production of weapons of active air defense and to deduce from the figures arrived at compared with the figures for offensive weapons in air warfare the repercussions of the one on the other.

1. Fighters. No detailed records are available at writing on 1939 plans for production in 1940, but a very reliable picture can be reconstructed from figures on the actual monthly output achieved.

In 1939 449 Bf-109 aircraft were manufactured in the September to December period, equal to an average

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monthly output of 112. The overall output in 1940 amounted to 1,693, or a monthly average of 141, and in 1941 to 2764 Bf-109 plus 228 Fw-190 making a total of 2,992

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or a monthly average of 249 aircraft.

It can therefore be assumed that plans after the outbreak of war provided for an average output of 150 fighters monthly in 1940 and of 250 monthly in 1941.

These figures can be considered reliable in view of the fact that in September 1941 the Luftwaffe General Staff planned for a monthly output of only 360 fighters, and in its computations undoubtedly included increased requirements for the campaign against the Soviet Union.

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232. Source 138.

233. Source 139.

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The output of bomber aircraft was as follows:

Aircraft Type	Sep-Dec 1939	1940	1941
Ju-88	69	2208	2780
He-111	452	756	950
Do-17	231	275	-
Do-217	1	20	277
Ju-87	134	605	500
Totals	887	3862	4507
Average per month	222	322	375

The entire output in Bf-110 twin-engine aircraft up to July 1940 was allocated to the offensive branch of the Luftwaffe. The average monthly output during this time was:

September-December 1939 39 Bf-110 planes

1 January-1 July 1940 79 " "

From July to October 1940 the entire output in Bf-110 planes, minus enough to equip 4 groups, was allocated to the night fighter arm, meaning that roughly 60 percent went to the defensive air forces.

A comparison of the aircraft manufactured for the offensive and for the defensive air arms produces the following picture:

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Period	OFFENSIVE	DEFENSIVE	
	Bombers & Twin- Engine Fighters	Fighters	Night Fighters
Sep-Dec 1939	261	112	-
1 Jan-1 Jul 1940	349	139	-
1 Jul-31 Dec 1940	351	143	59
1941	403	249	35

It is necessary to emphasize here that the above are actual production figures. They are not identical with the figures for monthly deliveries to the field units, in the computation of which the following factors must be taken into account:

- a. Deliveries to other users, such as tactical and strategic reconnaissance units, ground-support units, and schools;
- b. Rehabilitated aircraft from repair shops;
- c. Aircraft not accepted because of defects detected prior to delivery to the Luftwaffe.

A comparison of the figures on bombers and twin-engine fighters produced for the offensive branch with those on normal and twin-engine fighters for the defensive branch reveals that up to 1942 emphasis was still clearly on the offensive air forces.

233a

233a. Source 138.

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THE ANTI AIRCRAFT ARTILLERY BUILDUP IN 1939-40

The program established on 13 December 1938 for the antiaircraft artillery arm provided for the following production in the 1939-42 period:

Caliber	Monthly Output in Guns	Planned Total in Guns
20-mm	682	30 000
37-mm	109	5 000
88-mm	155	8 200
105-mm	152	2 000

The totals available at the outbreak of war were as follows:

20-mm and 37-mm guns	6 700
88-mm and 105-mm guns	2 600

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This reveals that plans provided for a strength in all calibers of antiaircraft guns by 1942 five times as great as that available at the outbreak of the war, which in turn is indicative of the high degree of importance attached to antiaircraft artillery for air defense.²³⁴

An examination of the production figures for the offensive with those for the defensive weapons of the Luftwaffe clearly shows that the strategic concept was directed in every sense at retaining the initiative to end the conflict with the Western Powers by attack.

THE 1940 WESTERN CAMPAIGN

Following the pattern applied successfully in Spain, Poland, and Denmark-Norway, operations for the first and second day of the campaign were planned in all detail and prescribed in orders.

The strategic objective in the planned air operations was consonant with the principles established in Paragraph 16 of THE CONDUCT OF AIR OPERATIONS, according to which the primary mission of the air forces was, "from the first day of warfare on" to annihilate the enemy air forces in their bases, and thereby at the same time serve the purposes of home air defense.

That, in the allocation of units, the offensive

234. Source 140.

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forces of the Luftwaffe were allocated everything required to insure the successful execution of their mission was strictly consistent with uncompromising logic.

As has been shown the necessity to provide fighter and twin-engine fighter protection for the bomber forces had become a fixed maxim after the experience gained in Spain and Poland.

The ten twin-engine fighter groups available on 10 May 1940 could not have fulfilled this protective mission alone.

In May 1940 the Luftwaffe had the following operable air units on line:

Bomber aircraft	1 120
Dive-bomber aircraft	324
Ground-support aircraft	<u>42</u>
Total available for bombing missions	1 504
Twin-engine fighter aircraft	248
Single-engine " "	<u>1 016</u>
Total available for escort missions	1 264

To oppose these forces the Western Allies (including the air forces of Belgium and Holland) approximately 6 000 aircraft, of which number 3 000 were stationed

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at airfields on the continent of Europe, the majority of
235
them fighters.

Faced by this situation the German Air Command could
not afford to leave fighter forces to defend targets in
the homeland.

With the exception of the 2d Group, 77th Fighter
Wing stationed in Norway, all fighter and twin-engine
fighter units in existence were therefore allocated ex-
clusively for operational missions to protect the attack-
ing German bombers against their western opponents. The
allocations and the assigned areas of operations were
as follows:

235. Source 130.

A. SECOND AIR FLEET ZONE OF OPERATIONS

Unit	Aircraft Type	Area
<u>HQ, First Fighter Wing</u>	Me-109-E	Northern Holland
1st Group, 76th Twin-Engines Fighter Wing	Me-110-C	" " "
1st Group, 186th Fighter Wing	Me-109-E	" "
<u>HQ, 2d Fighter Command</u>	"	Holland, Belgium, Northern France
<u>HQ, 3d Fighter Wing</u>	"	Holland, Belgium
2d Group, 3d Fighter Wing	"	" "
3d " "	"	" "
<u>HQ, 26th Fighter Wing</u>	"	Belgium, Northern France
2d Group	"	" "
3d "	"	" "
<u>HQ, 27th Fighter Wing</u>	"	" "
1st Gp., 1st Fight. Wing	"	" "
1st " 21st " "	"	" "
1st " 27th " "	"	" "
1st (Fighter) Group, 2d Training Wing	"	" "
<u>HQ, 51st Fighter Wing</u>	"	Holland
1st Gp., 26th Fight. Wing	"	" "
1st " 20th " " Me-109-D	"	" "
2d " 27th " " Me-109-E	"	" "

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THIRD AIR FLEET ZONE OF OPERATIONS

Unit	Aircraft Type	Area
<u>HQ, 3d Fighter Command</u>	Me-109-E	Belgium, France
<u>HQ, 2d Fighter Wing</u>	"	"
1st Group	"	"
2d "	"	"
3d "	"	"
4th "	"	"
1st " 76th Fighter Wing	"	"
<u>HQ, 52d Fighter Wing</u>	"	France
1st Group	"	"
2d "	"	"
1st " 51st Fighter Wing	"	"
<u>HQ, 55d Fighter Wing</u>	"	"
1st Group	"	"
2d "	"	"
3d "	"	"
<u>HQ, 77th Fighter Wing</u>	"	"
1st Group	"	"
1st G " 3d Fighter Wing	"	"
<u>HQ, 1 Flak Corps</u>		
26th Twin Engine Fight. Wing	Me-110-C	Belgium, North, France
1st Group, 1st Wing	"	"
2d " 26th "	"	"
3d " 26th "	"	"

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Unit	Aircraft Type	Area
<u>HQ, I Flak Corps</u> , -cont.		
76th Twin-Eng. Fight Wing	Me-110-C	Belgium, North. France
2d Group	Me-110-C/D	"
1st " 26th Wing	Me-110-C	"
<u>HQ, II Flak Corps</u>		
<u>HQ, 2d Twin-Eng. Fight. Wing</u>	"	Belgium, France
1st Group	"	"
5th(Twin-Eng), 1st Tng Wing	"	"
<u>HQ, V Flak Corps</u>	Me-109-E	France
<u>HQ, 54th Fighter Wing</u>		
1st Group	"	"
2d " 51st Fight. Wing	"	"
1st " 52dt Twin-Engine Fighter Wing	Me-110-C	"
2d " 1st Twin-Engines Fighter Wing	"	"

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At daybreak on 10 May 1940 the well-prepared all-out attack against the air bases of the Western Powers began. On the same day a number of bombs were dropped on the city of Freiburg im Breisgau, also in the morning. The official bulletin reported that 3 enemy aircraft had attacked the city and the airfield at Freiburg, killing 28 civilians, including children, injuring large numbers, and damaging a number of buildings.

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On 12 May 1940 two fighter groups were withdrawn from their offensive missions in the West and transferred on missions of air defense to Freiburg and Boehlingen.. These
238 were the 1st Group, 54th, and 2d Group, 51st Fighter Wings.

239 They were placed under Air District Command VII.

This event and the measures taken reveals what might be called an "after the event" tendency on the part of the Luftwaffe Command, a tendency which was to develop into a lasting attitude later in the war. It had been thought,

236. Sources 123, 125.

237. Source 129

238. Source 123.

239. Source 98.

as related previously in this study, that the forward movement of the fighter defenses to the front areas would make it possible to dispense with fighter protection for specific target areas in the homeland. Then, a small attack by three airplanes in a relatively insignificant area of Germany resulting admittedly in appreciable damage was sufficient to sway the command back to the idea of direct fighter defense for specific targets. There can be no doubt that this change in sentiment was due also partly to public opinion, which could find vigorous expression through the local Party organs outside of military channels.

To crown the whole absurdity, investigations by a military court established that the bombing of Freiburg had been done erroneously by a German flight of bombers. Catching sight of the city and airfield through an opening in the clouds the bomber crews had mistaken it for a target in France.

In contrast, the increasing activities of the Western Powers in air attacks against the Rhine-Ruhr region were accepted with stoical calm.

Allied bombing attacks on 10 May 1940 against the Krupp Works in Essen, and against a coal mine in the Ruhr region and another at Emmerich, on 11 May against Oberwesel, on 11-12 May against fifteen separate points in

the areas of Aachen, Muenchen-Gladbach, Dusseldorf, and Viersen, on 12-13 May against Duisburg, Kaldenkirchen, Cologne, Troisdorf, Siegen, Saarburg and other points passed without any reaction in the form of moving in fighter forces as a precaution against repetitions. Here, the cause for this inaction may have been that the damage done was small coupled with the knowledge that the industrial areas ^{had} strong antiaircraft artillery defenses, the repelling power of which could be considered sufficient, until the campaign in the west could be brought to an end, without support from fighters.

Events in the air operations in the West had increased the conviction that the execution of bombing missions under no circumstances could be risked without fighter protection. One event in particular strongly influenced thought in this direction:

According to prearranged operational plans, a bomber group equipped with He-111 planes was to attack the French air base Albert at Amiens on 11 May 1940. In discussions preceding the action it was realized that the 76th Twin-engine Fighter Wing, assigned to escort the bombers, could not, from its tactical airfields at Wahn and Niedermendingen provide escort protection through to the target, because the distance exceeded the extreme range of the

Me-110-C fighters by roughly 30 miles.

The bomber command stated its opinion that the He-111 bomber force by reason of its excellent defensive fire power could well afford to fly the last part of its route to the target without fighter protection, if escorts could be provided for the first part of the route and to receive the bombers on their return.

Thereupon it was agreed that fighters would escort the bombers to a designated point approximately 30 miles before the target, and that another fighter unit would be at the same point ten minutes later to escort the bombers on their return from their mission.

The 76th Twin-Engine Fighter Wing assigned its 2d Group, which escorted the bombers on their approach route, and the mission of escorting them on their return route was assigned to the 1st Group, 26th Twin-Engine Fighter Wing.

The approach under twin-engine fighter escort proceeded without interference, but during the bombing run and during the return to the point of juncture with the relieving unit of twin-engine fighters, French fighters downed 27 of the 30 bombers participating in the bombing mission.

This incident resulted in a general order from the

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Commander in Chief of the Luftwaffe prohibiting bombing
missions altogether except under fighter escort.

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From the above incident it is clear that all available fighter forces were required primarily to achieve the set operational objectives in the western campaign and that no fighter forces could be released for air defense missions in the zone of interior.

How desperately urgent the need was for fighters is evident from the fact that the two fighter groups (1st, 54th and 2d, 51st Fighter Wings) moved to Freiburg and Boetlingen in the first moment of shock after the attack against Freiburg were required, in addition to their defensive mission, to carry out escort missions and low-altitude attacks under directions from the V Air Corps in the southern sector of the front. Furthermore, the 6th Squadron of the 51st Fighter Wing in mid-May was transferred to Dinant, Belgium and placed under the 76th Twin-Engine Fighter Wing for the rest of the campaign.

At the beginning of June both groups were transferred to Vitry and Abbeville and returned to their parent unit, the 54th Fighter Wing. In the second phase of the campaign

240. Source 3.

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Photo

Me-110 Twin-Engine Fighter of the 76th
Twin-Engine Fighter Wing, Known generally
as the Shark (Haifisch) Wing.

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which commenced on 3 June 1940 with the launching of Operation Paula, an all-out air attack against air bases in the Paris area, both units were again committed exclusively in operational missions.

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WESTERN AIR SITUATION 10-31 May 1940

The dominant feature in the air situation from 10-31 May 1940 was the day and night harassing air attacks against the Heligoland Bight area and western Germany in general. The attacks were carried out by forces of between 7 and 25 aircraft, which dropped their bombs indiscriminately, usually on non-military targets. In the 10-22 May period penetrations occurred on five nights, in the 22-31 May period all penetrations were at night.

The heaviest attack was carried out on the night of 17-18 May by 40-50 bombers against the Hamburg and Bremen areas, resulting in 43 civilians killed and 10 wounded.

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The problem now evolving was thus not one of daylight but of night air defense.

This problem presented two aspects:

1. Means to provide night air defense by fighters were not available.

2. Night air defense by antiaircraft was to some extent problematical, since the enemy planes also

241. Sources 98, 123. 242. Source 129.

penetrated over German territory during conditions of poor visibility and indiscriminately bombed any targets found, targets which were without military significance and therefore had no antiaircraft defenses. The deaths and injuries inflicted in such attacks imposed the categorical necessity to provide defense against them. This defense could not be furnished by antiaircraft guns but only by fighters, which could operate more flexibly in larger areas.

The German air Command was quick to draw the logical conclusions from this compelling situation.

BUILD-UP OF THE NIGHT-FIGHTER ARM 1940

On 22 June 1940, the day on which the Armistice with France was signed, the 4th Group, 26th Twin-Engine Fighter Wing (1st Group, 1st Twin-Engine Fighter Wing) was withdrawn from the wing and transferred to the Muenchen-Gladbach air base. Captain Falk, who was in command of the group and with his group had distinguished himself particularly in defensive action against the British air attack on Wilhelmshaven on 18 December 1939, was ordered to report personally to the Commander in Chief of the Luftwaffe, promoted to major rank, and instructed to organize the 1st Night Fighter Wing.

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The reason why Captain Falk's group was selected for this mission was an after-action report the unit had turned in on action against British bombers attacking at night in Denmark. While the group was stationed there on the Aalborg airfield, in the period from 20 April-3 May 1940, British Wellington bombers in the night of 20-21 April staged a night attack against the Aalborg airfield. On its own initiative the group had gone into defensive action at twilight and continued its operations into the night.

Simultaneously with the instructions to Captain Falk to organize a night fighter wing, the 1st Searchlight Regiment, under Lieutenant Colonel Fichter, received orders to cooperate with the new night-fighter group in night fighter operations and was transferred to left of the Rhine River north of Duesseldorf for the purpose. The twin-engine fighter group was transferred to Duesseldorf.

Command authority in the region was vested in the local air district commander. Under this command the joint operations did not develop favorably. The searchlights were emplaced within the antiaircraft artillery zone and the air district commander naturally only committed the fighters when weather conditions were too unfavorable for antiaircraft guns even against targets

lit up by searchlights. The result was, that the fighters only went into action when weather and visibility conditions were also too poor for them to be effective. For some time activities were restricted to practice flights. Some of the crews were detailed to participate in training courses on blind navigation and the aircraft had to be reequipped for night operations.²⁴³

GERMAN AIR DEFENSES AFTER THE WESTERN CAMPAIGN

Immediately after conclusion of the Franco-German Armistice Agreement on 22 June 1940 a number of fighter units were withdrawn from operational missions and assigned air defense missions under the various air district commands, as follows:

Area	Unit	Station	Air District Command	Under
Norway	1st Gp., 76th Twin-Eng Fighter Wing	Stavanger	Norway	
	2d Gp., 77th Fight. Wing	Kristiansand	"	
Holland	<u>HQ, 54th Fighter Wing</u>	Schiphol	Holland	
	1st Group	"	"	
	2d " (1st Gp., 76th Wing)	Soesterberg	"	
	3d Group (1st Gp., 21st Wing)	"	"	
Helligoland Bight	<u>HQ, 1st Fighter Wing</u>		XI	
	1-2 fighter groups in rotation			
Ruhr Region	3d Gp., 3d Fighter Wing	Boenning- hardt	VI	

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Area	Unit	Station	Air District Command
Hanover	2d Gp., 27th Fighter Wing Wunstorf	VI	
Berlin	<u>HQ, 77th Fighter Wing</u>	Doeberitz	III
	1st Group	"	
	3d " (2d Gp., 186th Wing).	"	244

243. Source 67.

244. Sources 18, 92, 111, 123, 127, 141.

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Owing to the lack of records, the above tabulation is not complete. It is probable that elements of the 26th, 52d, and 53d Fighter Wings also displaced to their peace-time stations of Cologne/Duesseldorf, Wiesbaden, and Mannheim to protect the industrial areas.

While this general redisposition of forces was going on measures were taken to remove the confusion existing in the unit designation numbers, and in many cases, whenever necessary, the numbers of groups were changed to coincide with the numbering of their wings, as follows:

Old Designation	New Designation
1st Group, 1st Fighter Wing	3d Group, 27th Fighter Wing
1st " 20th "	3d "
1st " 21st "	51st "
1st " 76th "	54th "
2d " 186th "	77th "

Twin-Engine Units

1st Group, 1st Wing	4th Group, 26th Wing
3d " 1st "	3d " 76th Wing
1st " 52d "	2d " 2d "

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On 30 June 1940 the Commander in Chief of the Luftwaffe issued a general directive regulating air defense operations in the zone of interior. The directive contained the following instructions:

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1. Reinforcement of the home air defenses has become necessary because of increasing enemy air activities against the German economy. Main emphasis in air defense must be placed on the following: the command areas of District Air Commands XI, VI, and XII, and the western parts of Air District Commands XIII and VII

245. Sources 18, 142.

2. Tactical command over the fighter forces for the purpose of developing local power concentrations will in each case be exercised by a wing or fighter command headquarters.

3. Steps must be taken to insure reliable aircraft reporting services organized in depth and to insure smooth integration at the air district command boundaries. During weather favorable for surprise attacks by enemy air forces, air reconnaissance will be maintained by pairs of observation aircraft.

4. A high degree of readiness for action must be secured by light antiaircraft guns to repel British air units attempting to achieve surprise in attack by sudden dives through cloud ceilings.

5. All twin-engine fighter units will promote training in night fighting. Suitably qualified crews in the fighter groups will be committed in night fighter action on moonlit nights.

Exercises will be carried out to test the method of maintaining fighters on roving patrols within the antiaircraft fire zone but at altitudes closed for antiaircraft fire.

6. Units of the I and II Flak Corps will be deployed to protect the ground service organization in

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the occupied western territories. All weapons suitable for air defense action, including those of the Army, will be used to reinforce them. This applies also to organic air defense units of the Army, which will be committed as the local situation requires.

7. A close aircraft reporting network will be established along the coastline along the English Channel and the Atlantik to as far as Biarritz.

A seaborne coastal aircraft reporting service will be developed in cooperation with the locally responsible naval commands.

A coastal air reconnaissance patrol service will be organized with tactical reconnaissance Hs-126 type planes to detect enemy units at low altitudes and report their approach directly to the appropriate fighter and antiaircraft artillery units.

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The tenor of these instructions reveals that the German Air Command had shifted emphasis to defensive air warfare immediately after achieving its objectives in operational offensive warfare.

However, this period lasted only until new plans for continuation of strategic air warfare had taken on a more concrete form.

The main problem of air defense, that of night defense,

245. Source 143.

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was given a decisively vigorous organizational impulse with the assignment of General Kammhuber to command the existing night fighter division.

BUILD-UP OF THE NIGHT FIGHTER ARM IN 1940

With the assignment of General Kammhuber a personality was introduced into the night fighter arm who had important qualifications necessary for success in this field:

1. 1. General Kammhuber had received training as a fighter pilot in Russia. As former chief of the Operations Division of the Luftwaffe General Staff he furthermore had very special experience, from his tenure of office during the initial build up of the Luftwaffe, in the field of large-scale organization.

2. As former Chief of Staff, Second Air Fleet, he had wide experience in all fields of air operations, including those of the offensive and defensive forces and of the ground service organization.

3. As Wing Commander of the 51st Bomber Wing in the western campaign he had gained personal experience in the field of the modern operational methods of bomber forces.

Based on estimates of the performance capabilities of the Royal Air Force and on past experience concerning the objectives aimed at in air warfare by the British, it was safe to assume that the Ruhr region would continue to be the main target for attack by the British air forces.

For this reason General Kammhuber's first purpose was to establish a night-fighter belt in front of the Ruhr region. The basic idea in his system was to establish a searchlight belt 18 miles deep forward of the antiaircraft artillery fire zone. In this belt night fighters were to attack enemy planes lit up by searchlights before they could reach the antiaircraft artillery fire zone.

In order to be able to detect the approach of enemy aircraft in time to insure the timely take off of night fighters held under alert, one Wuerzburg A radar set was to be assigned to each searchlight battalion deployed within the searchlight belt.

The night fighter units were to remain in waiting positions behind the searchlight belt until called into action immediately after enemy units were detected by the Wuerzburg radar instrument. Relying on his own navigation the fighter pilot was to fly towards the probable point of contact so as to be ready in the vicinity as soon as forward line of searchlights of the belt picked up

the target. With each successive line of searchlights picking up the target as it left the effective lighting range of the line before, the enemy within the searchlight belt of 18 miles would be lit up for about ten minutes, and this, it was presumed, would be enough time for action by the night fighters committed. After organization of a headquarters staff, the night fighter division established at headquarters⁷ Brussels-Zeist, in Holland, and was placed under the Second Air Fleet, in whose zone of command the forward area of night fighter operations was located.²⁴⁷

On 21 July 1940 an important decision by the Commander in Chief of the Luftwaffe increased considerably the scope of the night fighter mission.

Orders were issued to include operations against hostile night fighter air bases in the night fighter missions as soon as appropriate standards of training were achieved.

This implied the organization of a strategic night fighter arm.

In the initial stages the organization of a close-in night fighter defense system to protect the Ruhr region was complicated by the lack of units suitable for night fighter operations and by the lack of searchlight units.

so far as the air units part of the problem was concerned, the only remedy was to release twin-engine units

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for the purpose. The requirements in searchlight units from the antiaircraft artillery arm could not be met before new units became available from the activation pro-

gram which would begin on 10 August.

For this reason the Night fighter division for the time being had to rely on only one night fighter group, the 1st Group, 1st Night Fighter Wing, and one searchlight regiment, the 1st Searchlight Regiment.

First experience showed that the area northwest of Duesseldorf was exceedingly unfavorable for night fighter operations because of the haze caused by industrial plants. Since the enemy units as a rule penetrated into the Ruhr region from northwest, the fighter group was transferred to Guetersloh and the searchlight regiment deployed northwest of Muenster in July 1940.

This measure soon proved sound by producing the first successes in night fighter operations.

247. Sources 67, 144, 145.

248. Source 146.

First Lieutenant Streib, a squadron leader in the night fighter group, was the first to bring down an enemy plane, but was soon followed by First Lieutenant Ehle and Sergeant Gildner, with Lieutenant Streib then following again, this time with two planes downed.

These successes gave increased impetus to the expansion of the night-fighter arm.

AIR BATTLE FOR BRITAIN, 1940

In the meanwhile the decision had been made concerning the continuation of the war. On 23 July 1940 British Foreign Minister Lord Halifax had rejected German Reich Chancellor Hitler's overtures of peace. Thereupon Britain was decided upon as the next strategic objective.

Once again the course in air armaments was changed, with main emphasis now once more on the offensive. The importance of fighter and twin-engine fighter forces to escort bombers and dive-bombers was increased by the fact that Britain had a well organized defense system and more particularly by the fact that the Royal Air Force had to be considered a serious opponent both in respect to the number and quality of its fighter forces. In air battles fought over Dunkirk Spitfires had given impressive proof of their capabilities in combat with the German Me-109 and Me-110 units.

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Between 5 and 8 August 1940 the Luftwaffe marshalled its forces for the air offensive against Britain. Of the forces transferred after the western campaign to the zone of interior for employment in defensive missions, only the following remained in the home defense system:

Unit	Station	Defense Area
<u>HQ, 77th Fighter Wing</u>	Dosberitz	Berlin area
3d Group	"	"
<u>HQ, First Fighter Wing</u>	Jever	Helligoland Eight
2d Group, 77th Fight. Wing	Kristiansand	Southern Norway
1st " 76th " "	Stavanger	Southwest Norway

At the same time a new fighter group was activated

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at Dosberitz, the 3d Group, 52d Fighter Wing.

The Battle for Britain opened on 15th August 1940.

The objective was to gain air supremacy over Britain as the primary condition for a invasion of the island. This objective was not achieved.

The chief reasons for this failure were as follows:

1. The conduct of strategic air warfare with bomber forces was seriously limited by the striking range of the fighter and twin-engine fighter forces required to escort the bombers on their missions.

2. In point of quality the British Spitfire fighter aircraft and the British fighter pilots

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Photo

British Spitfire Fighter Plane

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were equal to anything the German fighter and twin-engine fighter forces could send against them. Lacking the advantage of superior quality, which had been the deciding factor in Poland and France, the numerical ratio of the opposing forces decided the issue.

3. The narrow base area from which the German forces had to operate and the small area against which they were operating limited their opportunities for deceptive and misleading tactics and made it very easy for the British to throw their fighters into action in concentration at the currently critical points from case to case. This became acutely noticeable later, in the second phase of the air offensive, when the British had recognized the limits of possible operations and the German intention to adhere to London as their target. Without fear they were then able to strip areas farther off of fighters and concentrate everything on defense of the London areas.

4. Concurrently with the increasing intensity of British fighter defense action due to the above causes, the effective strength of the attacking German fighter and twin-engine fighter units declined steadily because of inadequate replacements in

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in trained personnel and aircraft.

The result was that, from early September on the escort units, particularly the twin-engine fighters, over enemy territory had to contend against a steadily increasing numerical superiority of British fighters. The great handicap for the German fighters here was that the time needed to bring an air action to a close frequently taxed their time-in-air capacities to the utmost limit, which gave all the advantages in battle to the defenders.

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SUB-DIVISION OF THE TWIN-ENGINE FIGHTER UNITS

AUTUMN 1940

As a result of these circumstances the Commanding Officer, 1st Fighter Command, who controlled all twin-engine fighter forces, came to the conclusion that continuation of strategic warfare in reliance on protection of the bombers by twin-engine fighter forces would be too costly. In a memorandum dated 15 September 1940 he submitted the following recommendations:

252. Source 3.

1. The establishment of mixed escort forces by assigning, tactically and administratively, 1 twin-engine and 2 single-engine fighter groups to each fighter wing as an organic unit.

2. The instalment of DB-601-N (High-altitude) engines in single-engine fighter planes in order to give them capabilities superior to those of the British Spitfires and increase their effective range.

The memorandum was submitted to the Commanding Officer, 2d Fighter Command for comments and on 24 September he recommended as follows:

1. That twin-engine fighters should only be employed as escorts on long-range missions and only in areas where weak fighter defenses could be expected.

2. Commitment of the twin-engine fighter units in air defense missions in order to release the single-engine units for operations against Britain. Owing to their longer time-in-air capacity each twin-engine unit of group size would be able to replace three single-engine units in this manner, also of group size.

3. Use of twin-engine fighters as fast bombers escorted by single-engine units.

4. The use of twin-engine units in night air defense.

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Second Air Fleet Headquarters submitted the above recommendations by the two fighter commands to the Commander in Chief of the Luftwaffe on 4 October 1940 with the following endorsements:

numerically

1. If opposed by weaker enemy fighter forces, the twin-engine fighter units were able in every respect to perform their missions as escort units. Difficulties only arise when the limitations of their time-in-air capacities compel them to break contact with opposing enemy forces of equal or superior numerical strength.

The recommendation of the 2d Fighter Command under Item (1) of its memorandum is approved by this headquarters.

2. It would be wiser to leave the twin-engine and single-engine fighters in their separate wings, but to consolidate the wings under fighter brigade or division headquarters in a ratio of 1 twin-engine to 2 or 3 single-engine wings under each such headquarters.

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The Commander in Chief of the Luftwaffe decided on the following compromise:

The 26th Twin-Engine Fighter Wing remained committed in operations at the English Channel, but was reequipped as a fast bomber force.

The 76th Twin-Engine Fighter Wing transferred

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its headquarters, together with its 3d Group to Norway, where it was assigned a defensive mission to relieve the 2d Group, 77th Fighter Wing currently stationed there. The fighter group was assigned to the 77th Fighter Wing, its parent unit, for operations on the English Channel front. The 2d Group, 76th Twin-Engine Fighter Group received planes with DB-601-N engines and was placed under Air District Command XI for daylight air defense missions.

The 2d Twin-Engine Fighter Wing was disbanded and transferred to the night fighter arm. Only its first squadron remained intact as a traditional wing unit under the new designation of 4th Squadron, 2d Night Fighter Wing.

The 2d Group, 1st Twin-Engine Fighter Wing was placed in the night fighter arm as a long-range night fighter unit and was reequipped with Ju-88 and Do-17 planes.

The 5th (Twin-Engine) Group, 1st Training Wing was redesignated as the 1st Group, 3d Night Fighter Wing and transferred to the night fighter arm.

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253. Source 148.

254. Source 149.

EXPANSION OF THE NIGHT FIGHTER ARM

1940-41

In making the decisions just described above the Commander in Chief of the Luftwaffe undoubtedly was seriously influenced by concern over the increasing British night attacks. The release of twin-engine fighter units for the purpose was the only possibility to reinforce the night fighter arm without delay. Normal training for twin-engine fighter personnel included the subjects of fighter action and blind and instrument navigation. Daylight fighter personnel lacked training in the latter, bomber personnel in the former of these two subjects.

Since the Me-110 plane was quite suitable for blind navigation, had very heavy fire power, and an adequate time-in-air capacity (2 hours and fortyfive minutes) for night operations of limited duration, no quicker and sounder solution of the problem could have been found.

Even before the measures just described were taken, realization of the necessity for a speedy expansion of the night fighter arm, which in July 1940 had only one group, the 1st Group, 1st Night Fighter Wing, had led to the transfer of available units to the arm prior to October 1940.

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These transfers began with the withdrawal of one squadron of the 1st Group, 76th Twin-Engine Fighter Wing in August 1940 from its defensive mission in Norway, where it had not been employed to full capacity, and its transfer to Deelen, Holland, where its personnel were trained in night fighter tactics by a squadron of the 1st Group, 1st Night Fighter Wing, also transferred to Deelen. Another squadron of the twin-engine fighter group was transferred from Norway to the 1st Group, 1st Night Fighter Wing, and, finally the last remaining squadron together with the group headquarters was used to establish the 2d Group, 1st Nighter Fighter Wing at Deelen.

The 4th Group, 2d Fighter Wing included as its 10th squadron the unit which had conducted night fighter experiments prior to the war and therefore had experience in this field. Prior to the opening of the offensive against Britain this group was assigned to the night fighter division to form the 3d Group, 1st Night Fighter Wing. Initially this group had Me-109-E aircraft. Since they were found unsuitable for the purpose because of their small time-in-air capacities and their inadequate equipment for blind navigation, reequipment of

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the group's squadrons with Me-110 aircraft commenced in December 1940.

At the end of 1940 the following night fighter forces were in existence:

Unit	Aircraft Type
<u>HQ, 1st Night Fighter Wing</u>	Me-110-D
1st Group	"
2d "	"
3d "	Me-110-C/D & Me-109-E
1st " 2d Night Fighter Wing	Ju-88 & Do-17 for long-range missions
4th " 2d " " "	Ju-88 for long-range missions
1st " 3d " " "	Me-110-D

Up to the end of December 1940 the 10th Squadron, 1st Fighter Wing, designated as a night fighter unit, remained committed under Air District Command Holland at Vlissingen.

Its mission there was to intercept British reconnaissance aircraft, which frequently penetrated over the Schelde estuary areas during twilight, either during their approach or return flight.

The newly established 1st Group, 3d Night Fighter Wing was organized from the former 5th (Twin-Engine) Group, 1st Training Wing.²⁵⁵

255. Sources 18, 67, 150, 180.

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The authorized strength of the night fighter units was as follows:

Wing Headquarters 3 aircraft with crews

Group Headquarters 3 aircraft with crews

Squadron 12 aircraft with crews

Group 29 aircraft with crews

Reports by the Chief of Luftwaffe Supply and Administration for 2 November 1940 show the following strengths in twin-engine and single-engine night fighter forces

Authorized	Actual	Effective			
Aircraft	Crews	Aircraft	Crews	Aircraft	Crews

207	207	172	161	93	95
-----	-----	-----	-----	----	----

The authorized strength of 207 is calculated on the basis of 5 groups of each 39 aircraft plus 1 squadron of 12 aircraft.

At the end of December 1940 the 10th Squadron, 1st Fighter Wing was transferred to the daylight fighter forces as the 1st Squadron of the same wing.

Reports by the Chief of Luftwaffe Supply and Administration for 28 December 1940 show the following strengths in twin-engine night fighter forces:

Authorized	Actual	Effective			
Aircraft	Crews	Aircraft	Crews	Aircraft	Crews

195	195	165	173	104	61
-----	-----	-----	-----	-----	----

²⁵⁶. Sources 54, 102, 153. ²⁵⁷. Source 150.
²⁵⁸. Source 102.

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These figures remained unchanged by new activations up to 29 March 1931.

The report by the Chief of Luftwaffe Supply and Administration for 29 March 1941 is the first to show an increase in authorized strengths by 1 wing headquarters (the 3d Night Fighter Wing) and 1 squadron (the 4th Squadron, 2d Night Fighter Wing. It also shows 115 effective crews against 124 effective aircraft available, a sign of the good results produced by the preceding training period.

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SEARCHLIGHT SUPPORT IN NIGHT FIGHTER OPERATIONS

1940-41

Hand in hand with the build up of night fighter forces went a considerable expansion of the searchlight forces organization. From July 1940 on the following new units were established:

Unit	Mission
1st Searchlight Brigade	Development of the searchlight belt in northwestern Germany
2d " "	Development of the searchlight belt west of the Rhine-260 Ruhr region.

RULING PRINCIPLES IN THE ORGANIZATION AND
EQUIPMENT OF NIGHT FIGHTER FORCES

From 1 September 1940 on the night fighter arm

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was organized and expanded in accordance with the following principles:

1. Strategic or Long-Range Fighter Forces.

Purpose. Action against the enemy air forces in the form of attacks with bombs and weapons fire against their bases, to include dispersal fields, and units taking off or landing at the bases; Action against enemy air forces during their approach and return flights.

2. Tactical or Close-In Night Fighter Forces.

a. Illuminated Night Fighter Defense, with support from searchlight units. Plans provided for the development of a searchlight belt 18 miles in depth forward of a line extending from Schleswig through Kiel, Hamburg, Bremen, the Ruhr region, Arnhem, Venlo, and Liege and of a second belt to protect Berlin and extending from Guestrow through Stendal to Gardelegen.

The searchlight beams were to be directed by means of sound locators in the direction of approaching aircraft.

259. Source 153.

260. Source 154.

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Photos

Left: Mobile Wuerzburg Type Radar

Right Freya Type Radar

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On 16 October 1940 the night fighter division received its first Wuerzburg A radar set, which was installed in a Freya type radar position at Zuphten in Holland. Initially this instrument was used to control the movements of night fighters and guide them, by means of radio messages, to targets picked up by searchlights.

As more of these instruments became available they were placed in positions at the forward boundary of each searchlight battalion zone to insure earlier detection of approaching enemy aircraft and to guide night fighters and searchlights towards them.

Continued deliveries made it possible to place one instrument at the rear boundary of each third searchlight battalion in order to establish the same advantages against enemy units during their return flight.

Of each 3 Wuerzburg instruments in operation 1 was assigned to control the operations of night fighter aircraft, in addition to which some of the coastal positions also had a Freya instrument with a supplementary control set (Freya-Gerast mit AN-Fuehrungszusatz). This made it possible in time to develop a system in which the position of an enemy plane and the German night fighter could be computed centrally on a plotting table and transmitted by radio to the night fighter in the form of an "intercepting

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point order", thereby guiding the fighter pilot so close to his target that he could sight and attack it.

This method was also tried with targets not spotted by the searchlights and proved successful on moonlight nights. Finally, it was adopted as the standard system in night operations without searchlight support.

b. Night Fighter Defense without Searchlight Support. The limitations imposed on searchlight operations by weather conditions soon made it clear that the protection afforded by illuminated night fighter defense was inadequate to prevent night attacks, and that this inadequacy increased as the enemy increased attacking in unfavorable weather conditions with growing frequency.

A starting point for a solution of this problem existed in the results obtained in the previously mentioned experiments at using a radar instrument to detect the enemy plane and guide the night interceptor to it. The inaccuracy of the data obtained with the radar sets then in existence necessitated a high degree of ability on the part of the fighter control officer at the radar instrument to guide the night fighter to within sight of his target, and only very few experts achieved such high standards.

Until the Wuerzburg Riese fighter control radar set

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was introduced in 1941 radar positions were therefore so arranged that they could serve to control both daylight and night fighter operations.

By 31 December 1940 units of the night fighter division shot down 42 enemy planes, most of them with searchlight support, some in strategic night missions, and some in night operations without searchlights.

In tests carried out without searchlights it had been found that even on light nights the detection of a target with the naked eye was more or less a matter of chance. This naturally led to the requirement to extend the range of human vision through the installation of radar locators on the fighter aircraft. A laboratory test model of a radar instrument, known as the Lichtenstein B/C, was developed for this purpose, but was not ready for delivery to active units before the autumn of 1941. 261

COMBINED NIGHT FIGHTER-ANTIAIRCRAFT ARTILLERY OPERATIONS IN 1941

Early in January 1941 the 1st Squadron, 1st Night Fighter Wing, was transferred to the Berlin area to carry out tests in night operations with searchlight support and in combination with antiaircraft artillery within the defense target area.

Test I was to try out the feasibility of night

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fighter action action in the rear of the defense area, while most of the guns in the antiaircraft artillery zone withheld fire.

Test 2 was to try out the practicability of simultaneous night fighter and antiaircraft artillery action against enemy aircraft over the target area.

Test 3 was to try out the effectiveness of night fighter action against enemy aircraft in a zone forward from the target area.

The Air Defense Commander in Air District Commands III and IV reported on the results obtained in these tests on 8 March 1941 as follows:

1. Test 1. Operations of this type can be carried out without complications. Preparations can be made for the aircraft and the necessary signal communications at short notice.

2. Test 2. Operations of this type can be executed by three methods:

a. Night fighter action within the antiaircraft zone. The antiaircraft artillery will attack the enemy until the night fighters are close by. During the night fighter action, antiaircraft guns in the sector will withhold fire. The scope on which anti-aircraft fire would have to cease appears excessive.

261. Sources 22, 144.

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b. The zones of action for the antiaircraft artillery and for the night fighters will be separated in altitude, the antiaircraft artillery zone extending up to approximately 11 500 feet (3 500 meters), where the night fighter zone would begin. It would be impossible to avert endangering friendly fighters, especially if they fly in to attack enemy aircraft within the antiaircraft fire zone. The chances of success in this type of operations seem small, since the opportunities for successful action by night fighters would be limited, while the enemy would have improved opportunities to bomb from altitudes above 11 500 feet.

c. Night fighters to operate within zone of antiaircraft fire and to be identifiable by a marking which would appear on the radar screen. On appearance of this marking antiaircraft fire would cease until the marking and the enemy plane appear separately on the radar screen.

This method appears to be the solution best worthy

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of efforts to adopt.

The 1st Squadron, 1st Night Fighter Wing took the opportunity during these tests to carry out experiments in night fighter action without searchlights, but had only one Wuerzburg A instrument available to track enemy

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planes. The whole principle proved impracticable because the data obtained was far too unreliable for the plotting of courses, and because there was no certainty that the fighter pilot would adhere rigidly to the course he was ordered to fly. For these reasons the system of night

262. Source 155.

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fighter operations with searchlights had to be retained until an adequate number of Wuerzburg Riesen fighter control radar could be made available to instal two in each radar station, one to track the target, and one to control the friendly fighter. The radar station system therefore had to be established along the searchlight belt for the time being, with an outpost area extending as far as the coastline of the English Channel.

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REVIEW OF EXPANSION OF THE NIGHT FIGHTER ARM

So far as developments in night fighting are concerned it can be said of the 26 June 1940-21 March 1941 period that

1. The whole system was placed under the command of a particularly capable officer of the Luftwaffe, who went about his mission with foresight, intuitive understanding, and energy.
2. The release of twin-engine fighter units for the purpose after failure of the air offensive against Britain made a quick expansion of the night fighter defense system possible.
3. The combination of long-range and close-in defense night fighter operations provided a concept offering optimum chances of success.

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4. In view of the fact that the enemy still showed a preference for light nights in which to carry out night attacks and still had to rely on good visibility for the aimed bombing of targets of military importance, the system of night fighter operations with searchlight support provided the best protection and was most appropriate to the tactics employed by the enemy.

5. With appropriate foresight and well ahead of time measures were introduced to create favorable conditions for night fighter operations through an increased delivery of radar instruments to the ground service organization and through the development of a radar target detector for installation on night fighter aircraft.

263. Source 145.

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REINFORCEMENT OF THE DAYLIGHT FIGHTER FORCES

IN THE ZONE OF INTERIOR, 1940-41

As a result of the failure of the air offensive against Britain and because of the limited opportunities for air operations owing to weather conditions, a number of daylight fighter units were also withdrawn from action at the Channel coast by the end of 1940 and were transferred to the air defense forces under the various air district commands.

This measure was not in response to any acute necessity resulting from the current air situation, but was more in the nature of a precaution. The Royal Air Force had shown that it had exceptional capabilities for long-range penetrations. On the night of 26-27 August 1940 its units had attacked Berlin, and on the night of 27-28 August a number of Whitley bombers had attacked the Skoda armament works at Pilsen, in Czechoslovakia.²⁶⁴

All areas of penetration were within the command zones of the Second Air Fleet, and no attacks against German territory had so far been carried out in the zones of the Third Air Fleet.

On 1 January 1941 the following forces were stationed within Germany and Holland in daylight air defense missions

264. Source 112.

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Air District Command	Unit	Defense Area
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III-IV	1st Group, 27th Fighter Wing	Berlin-Central Germany
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XI	<u>HQ, 1st Fighter Wing</u>	Helligoland Eight
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	1st Gp., 54th Wing	" "
--	--------------------	-----

2d	" 76th Twin-Eng. Fighter Wing	" "
----	----------------------------------	-----

VI	1 swarm* from the 3d Gp., 3d Fighter Wing	Ruhr Region
----	--	-------------

Holland	2d Gp., 52d Fight.Wing	Holland
---------	------------------------	---------

1st	" 1st " "	"
-----	-----------	---

The strongest defensive forces were allocated to the Helligoland Eight areas. It was presumed that the fighter forces stationed in Belgium and Northern France provided adequate protection for the Ruhr region against any penetration by enemy bomber forces. The rearward transfer of one swarm* from the 3d Group, 3d Fighter Wing, to the vicinity served the purpose of intercepting at their mission target the enemy reconnaissance planes which frequently penetrated undetected by wide detour routes.

In addition a start was made in November 1940 at employing fighter training units in air defense missions in areas for which no other fighter forces were available.

The first training units so employed, in southern Germany, were groups of the 26th Twin-Engine Fighter Wing,

*Between 4 and 6 aircraft. Not a standard unit.

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Germany, were groups of the 26th Twin-Engine Fighter Wing, which had been transferred to Memmingen for rehabilitation and to establish the 2d Twin-Engine Fighter Pilot School, and the twin-engine fighter replacement group stationed at Vaerlose, Denmark. All of these groups were under administrative and disciplinary control by the Chief Training Officer, under tactical control by the local air district commands.

This measure must be considered an improvisation made necessary by the lack of adequate fighter units.

On 9 February 1941 the same measures were applied to the replacement squadrons of the 52d and 77th Fighter Wings, in the command zone of the First Air Fleet. On 29 March the squadrons were expanded to form replacement groups and placed under tactical control by Air District Command III. The 51st Replacement Fighter Group and the 26th Twin-Engine Replacement Fighter Group, both in the area of Air District Command II, and the 76th Replacement Twin-Engine Fighter Group, in the area of Air District Command XI, were also assigned air defense missions.

The purpose of these measures was to have a large number of tactical units, in strengths varying between

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2 and 12 aircraft, stationed throughout Germany in order to insure better opportunities for action against enemy reconnaissance planes, against which the available anti-aircraft artillery forces were not adequately effective. In addition, these units represented a reserve force for action against penetrating enemy bomber forces.

The 1 January-21 March 1941 period brought no appreciable changes in the strength or organization of the front line units allocated for daylight and night air defense.

FIGHTER DEFENSES WITHIN GERMANY

Status 18 March 1941

I. FIRST AIR FLEET COMMAND ZONE

Air Defense Commander in Air Districts III and IV.

52d Replacement Fighter Group

77th " " "

Air District Command II

51st Replacement Fighter Group

26th " Twin-Engine Fighter Group

II. SECOND AIR FLEET COMMAND ZONE

Night Fighter Division.

HQ, 1st Night Fighter Wing

1st Group

2d Group

3d Group

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SECOND AIR FLEET COMMAND ZONE--Cont.

HQ, 1st Night Fighter Wing--Cont.

1st Group, 2d Night Fighter Wing (Strategic)

4th " 2d " " " "

HQ, 26th Twin-Engine Fighter Wing

1st Group (minus 1st Squadron with X Air Corps), 3d
Night Fighter Wing

Air District Command XI

HQ, 1st Fighter Wing

1st Group, 54th Fighter Wing

2d " 76th Twin-Engine Fighter Wing

76th Replacement Twin-Engine Fighter Group

Replacement Twin-Engine Fighter Group Vaerløse

Air District Command VI

1 Swarm from 3d Group, 3d Fighter Wing

Air District Command Holland

1st Squadron, 1st Fighter Wing

HQ, 52d Fighter Wing

1st Group (Only under tactical control by Air Dis-
trict Command Holland).

III. Third Air Fleet Command Zone

Air District Command VII

1st Group, 26th Twin-Engine Fighter Wing.

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FIGHTER DEFENSES IN THE WEST, 1941

The air defenses in the outpost areas of Belgium and France had been weakened by preparations for the organization of the Africa Corps and for occupation of the Balkan areas, which from 1 January 1941 on had necessitated the withdrawal of fighter and twin-engine fighter forces.

The following units were transferred to Germany for these purposes:

HQ, 27th Fighter Wing with its 2d and 3d Group, 1 Squadron from the 26th Fighter Wing, and the 2d and 3d Groups, 26th Twin-Engine Fighter Wing.

The fighter forces remaining available for air defense in Belgium and France on 18 March 1941 were as follows:

2d Fighter Command: Channel coast to mouth of Seine River

HQ, 3d Fighter Wing with 3 groups

HQ, 26th " " " 4 "

HQ, 51st " " " 7 "

HQ, 53d " " " 2 "

Approximately one-third of these units were constantly out of service, since measures had commenced early in 1941 to reequip them with Me-109-E planes powered by DB-601-N (high-altitude) engines and GM-1 engines burning a fuel with a hydro-methanol admixture,

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and some of them with the new Me-109-F planes.

3d Fighter Command: Channel coast from Seine River to
Brest.

HQ, 2d Fighter Wing with 3 groups

HQ, 54th " " with 2 groups (fighter-bombers)

HQ, 77th " " with 2 groups (one of them
fighter bombers)

2d Replacement Fighter Group

26th " " "

53d	"	"	"	265
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FIGHTER-BOMBER UNITS IN THE WEST, 1940-41

It is noticeable from the above tabulation that three fighter groups under the 3d Fighter Command were intended as fighter-bomber forces. The events leading up to this development clearly reveal how strongly the German Air Command was influenced by the ideas of offensive air warfare.

While the air offensive against Britain was still in progress the only ground-support group equipped with Me-109-F planes, the 2d Group, 2d Training Wing, had been committed with considerable success in bombing attacks, under fighter escort, against London.

266. Source 156.

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Photo

Me-109 Fighter-Bomber

THIS PAGE DECLASSIFIED IAW EO12958

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This form of attack had caused considerable confusion in the British defense system and had compelled British fighters to take off even if only German fighters were reported approaching, since there was no way to determine whether the approaching force included Me-109 aircraft carrying bombs. This caused the British unnecessary attrition, exactly what the German command intended with this form of attack.

Although the personnel had no training in fighter tactics, the ground-attack group incurred practically no losses in these operations, which was due to the speed of the Me-109.

Another unit of this type was the 210th Bomber Group, equipped with Me-210 bombers, and Me-109 fighter escort planes.

When the daytime bombing offensive came to an end in October 1940 and the German Command found itself compelled to restrict its operations to a type of harassing raids of questionable effectiveness during bad weather and under cover of night, the success achieved in the fighter-bomber attacks by the 2d Group, 2d Training Wing and the 210th Bomber Group was called to mind. The first step now taken was to relieve the 26th Twin-Engine Fighter Wing of its escort mission and employ its units as

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bombers under fighter escort. Instead of also transferring

this wing to the night fighter arm, the determination was

to maintain in force the slogan of "bombs on Britain."

This type of bombing very soon proved a complete fail-

ture, and both the twin-engine fighter-bombers and the

single-engine fighters units escorting them incurred heavy

losses.

Lacking special bomb aiming sights, the units had to

do their bombing in a glide flight at low or almost ground

levels. With its speed already reduced by 18-24 miles

because of its bomb-carrying equipment, the Me-110 when

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operating at low levels, because of its large size and inadequate maneuverability and its inability to exploit its superior sloping and diving speeds was no match for the British fighters and was an easy kill for them. Compelled to follow the twin-engine unit they were escorting, the fighters had to sacrifice the advantage of altitude and also found themselves in an extremely unfavorable position for combat against the British fighters attacking them at great speed from higher altitudes.

Since the results achieved were entirely out of proportion to the losses incurred, the 26th Twin-Engine Fighter Wing was withdrawn from action, its 2d and 3d Group in mid-November, wing headquarters on 2 December, and its 3d (sic)

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Group on 11 December 1940.

Simultaneously with the reequipment of the 26th Twin-Engine Fighter Wing for bombing operations, orders were issued to reequip other fighter units as fighter bombers. The units in question were the 3d, 51st, and 53d Fighter Wings
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and the 1st Group, 2d Training Wing.

The following directives were issued by the Commander in Chief of the Luftwaffe governing the operations of dive-bomber units:

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267. Sources 93, 157, 158, 159, 160.
268. Source 149.

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1. The purpose of the operations is to maintain continuous attrition attacks against London. In order to insure continuous uneasiness on the part of the enemy the size and timing of the attacks must vary constantly.

2. The important point is not only to commit strong forces against London during favorable weather, but to have bombs falling on London over as long a time as possible.

The strength of the units committed will be decided in accordance with current weather conditions.

3. A closed cloud ceiling along the approach route will not be considered a deterrent if weather reconnaissance has reported that the ground is visible from the air over London.

4. All crew members will be informed of the importance of this war of attrition. Any abatement in this form of operations at a wrong time could prevent early success in the war, so that the sacrifices already made would be in vain.

This ceaseless war with bombs is also a proof of
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the aggressiveness of German fighter pilots.

It would be impossible to show more clearly than by these instructions how the principle of offensive action

269. Source 161.

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as the decisive factor in air warfare dominated all thought in the German Air Command.

AIR DEFENSE IN RUMANIA, 1940-41

In the end it was Southeastern Europe once again which led to a further weakening of the German air defenses in the West, so far as fighter defense was concerned.

The very friendly relations existing with Rumania under General Antonescu resulted in permission for Germany to protect her own vital interests in the Rumanian oil regions with German air defense forces.

The German Air Mission, under Generalleutnant (Major General) Speidel, received instructions to assume responsibility for the oilfields and oil refining installations in the Floesti region and for the training of the Rumanian Air Force.

The first fighter forces assigned for these purposes were the 9th Squadron of the 3d Group, 52d Fighter Wing--the group newly activated at Doeberitz in August 1940--, the recently organized headquarters of the 1st Group, 28th Fighter Wing, and two tactical reconnaissance squadrons--the 3d of the 13th and the 4th of the 13th Tactical Air Reconnaissance Group, both equipped with Hs-126 and Me-109 planes. The latter squadron was to serve as what might be called an airborne aircraft reporting service.

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These were followed on 11 November 1940 by the other two squadrons of the 52d Fighter Wing (the 7th and 8th) hitherto committed to defend Berlin.

On 26 November 77th Fighter Wing Headquarters and the wing's 3d Group were withdrawn from the Berlin defenses and transferred to the English Channel to close the gap caused by the withdrawal from there of the single- and twin-engine fighter units intended for operations in the Balkans and for the Africa Corps. The 1st Group, 27th Fighter Wing took the place of the 77th Wing in the Berlin defense system, where it remained until also withdrawn on 8 February 1941 for participation in the Balkan campaign. Responsibility for the air defense of Berlin was then assigned to the newly established 52d and 77th Replacement Fighter Squadrons, activated under Air District 270. Command III.

These measures alone serve to show how the expanding theaters of war were straining the available fighter forces to the utmost, to such an extent that it became increasingly necessary to make use of what might be called

270. Sources 149, 162, 157, 163, 164.

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improvised units formed with competent training crews from the training schools for air defense in the zone of interior.

Sight must not be lost here of the fact that the Royal Air Force at that time would have been in the position to outmaneuver the entire German fighter defense system along the Channel coast by dispatching its Wellington and Whitley bombers across the North and Baltic Sea to strike into the far German rear, where they would not have encountered any very effective air defenses. However, at that time, in early 1941, the British apparently had not yet recovered from the serious shock they had received on 18 December 1939. They continued to adhere to their tactics of night bombing, placing upon the German Air Command the primary concern for the development of night air defenses.

These circumstances may have contributed towards encouraging Hitler as early as at the end of 1940 in his thoughts, which he had broached already in August of that year, of a campaign against Russia, the successful conclusion of which was to compel Britain to accept peace, and it may have been the factor which gave these thoughts a concrete form.

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PREPARATIONS FOR THE RUSSIAN CAMPAIGN

The directive issued by Hitler on 18 December 1940 contains the following passages concerning Operation Barbarossa, the plan of operations prepared against the eventualty of war with the Soviet Union:

For the Luftwaffe the important point in the Eastern campaign is to make such strong forces available to support the Army that it will be possible to count on swift progress in operations on the ground and that the damage done to the eastern territories of Germany by enemy air attacks will be as small as possible. This power concentration in the East is limited by the requirement that all areas of operations and armament production under our control must remain adequately protected against enemy air attack and that the offensive war against Britain, particularly against British import traffic, must not cease.

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Under any circumstances, this implied the withdrawal of strong fighter forces from the western theater and thereby a considerable weakening of the air defenses against the West. On the other hand, the whole idea of another Blitz campaign would have been utopian without air support by the fighter forces thus withdrawn.

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AIR DEFENSE MISSIONS IN ITALY

In addition to the above requirements, a Joint Military Command (OKW) directive of February 1941 instructed the Luftwaffe, in cooperation with the Italian Air Force and the Italian Naval Command Catania, to protect German seaborne transportation from Sicily to Northern Africa, including the loading and unloading operations, against
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the enemy air and naval forces.

In spite of the heavy demands which thus would be made in the near future on the existing German fighter forces for operations in the eastern, southeastern, and southern theaters of operations, no concrete planning was done to increase the existing number of fighter units. As previously mentioned above, the Luftwaffe General Staff in September 1941 still considered that a monthly output of 360 fighter aircraft would be adequate to meet resupply and replacement requirements. This is proof that no serious threat of daytime air operations against the German armament industry was expected to develop in the foreseeable future.

271. Source 165.

272. Source 166.

COMMAND AND TACTICAL PRINCIPLES FOR
THE FIGHTER ARM, 1941

In view of the large number of fighter units distributed all over Germany in air defense missions, it was necessary to establish new principles governing the tactics to be employed and the responsibilities in this field.

This was done in a bulletin issued by order of the Commander in Chief of the Luftwaffe through the Air Operations Section of the Luftwaffe Operations Division (Führungsstab Ia) on 3 March 1941 and containing the following instructions:

1. The air fleets and the Air Command Center are responsible for fighter defense in their command zones with the fighter forces assigned to them. As a rule they will delegate this responsibility to fighter commands, which will subdivide the signal communications and aircraft reporting networks into defense sectors according to the requirements of their respective zones.

2. For the exercise of local command authority in these defense sectors, the fighter commands will be assigned fighter wing or group commanders or, in rearward areas, officers in command of one or a

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number of independently operating squadrons (tactical units from schools).

These officers will be fully responsible within their sectors and will conduct operations independently under directives from the air fleets or fighter commands. They are authorized to order the various stages of alert to assign combat missions, and to commit their reserves. They will control their units either from the ground or from their lead plane. In the latter case a permanent deputy will be appointed.

3. The officer at the head of the fighter command will only assume personal command if forces stronger than one wing are committed in any one of his sectors or if it appears wise to employ units outside of their sectors.

4. If large enemy units under fighter escort are encountered units will be detailed to engage the enemy fighters, if the enemy unit is flying in close formation, while complete fighter groups attack the bulk of the enemy force.

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5. Enemy surprise raids in the coastal and other forward areas will be countered by the stationing of fighter units on airfields in the coastal or near front areas and by a high stage of alert.

6. To supplement the aircraft reporting service officer observers will be stationed in advanced posts with a clear field of vision as a precaution against a surprise approach of enemy aircraft at low altitudes.

7. If possible a DF post will be established in each defense sector to safeguard fighters in flight.

8. If at all possible the command post of the sector commander, the radio station, and the processing center for Freya and Wuerzburg radar messages will all be established in one and the same building; the processing center of the intercept service will be connected (by means of a loudspeaker).

9. Steps will be taken to insure close contact between the sector commander and the antiaircraft artillery commanders committed within the sector in order to secure smooth cooperation in defense action.

The bulletin was signed by General Jeschonnek, Chief
of the Luftwaffe General Staff.

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The arrangement thus established was very similar to

273. Source 175.

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the British system of defense sectors with an independent command within each individual sector. However, it certainly was the system best adapted to the current air situation, the characteristic features of which were at the time, so far as Germany was concerned, irregular penetrations by individual enemy reconnaissance planes and, in the western outpost areas, occasional surprise raids by small units of medium bombers under fighter protection directed against targets near the coast.

However, the establishment of specific fighter commands as a generally accepted integral part of the air defense organization already indicated a development which was to lead later to the centralized control of all fighter forces for the purpose of developing power concentrations, a development which the measure greatly facilitated.

FIGHTER STRENGTHS IN 1940-41

The following figures on the numerical strength of the German fighter arm are taken from reports by the Chief of Luftwaffe Supply and Administration:

Date	Authorized Aircraft Crews	Actual Aircraft Crews	Effective Aircraft Crews
<hr/>			
1940			
Jun 29.	1171	1171	1107
Aug 3.	1171	1171	1065
Sep 28	1132	1132	932
Nov 2.	1141	1141	921
Dec 28.	1162	1162	832
<hr/>			
1941			
Mar 29	1375	1375	1158
			1259
			846
			1136
			274

274. Source 101

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The authorized strengths listed merit special attention. On 3 August 1940 the entire fighter arm consisted of

10 wing headquarters, 28 fighter groups, and 1 night fighter squadron (10th of 1st Fighter Wing).

The difference between the figure for 3 August and 28 September, showing a reduction of 39 aircraft, is due to the transfer of the 4th Group, 2d Fighter Wing to the
275 night fighter arm.

The increase in authorized strengths between 2 November 1940 and 29 March 1941 is due exclusively to the organization of 6 replacement fighter groups, the 2d, 26th, 51st,
276 53d, and 77th.

Another noteworthy feature is the decline in actual strengths in the 3 August to 28 December 1940 period, and particularly the decline in aircraft strengths, which shows that deliveries from new output and repair workshops were definitely inadequate. In this period a total of 931 aircraft were damaged to an extent exceeding 10 percent, which meant that they had to sent to factories for repair.

Aircraft replacements received from output and repair workshops in the 1 August to 31 December 1940 period totalled 277 831 Me-100 planes.

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This shows that as far as fighters were concerned the loss in Me-109 aircraft was 100 more than could be replaced from production.

The most unfavorable ratio becomes apparent, however, in the figures reflecting operability. On 28 December 1940 the actual strength in aircraft was only 70 percent of the authorized figure, compared with 82 percent on 29 June 1940. This shows that the units were receiving inadequate supplies in spare parts required in first echelon maintenance.

It remains finally to examine the figures on crews actually available.

275. Source 149.

276. Source 167.

277. Sources 101, 138.

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In the 29 June-2 November 1940 period 565 crews were lost through enemy action, killed or wounded. By 2 November only 332 could be replaced, showing a shortage of 233 coming from the training schools, a sign that the capacities of the fighter pilot training schools were far from adequate.

In the 2 November to 28 December 1940 66 crews were lost and for the first time the schools were able to furnish replacements totalling 47 more than the losses had been. Here, however, it must be pointed out that in the inclement weather during this season there had been less fighter action than in the preceding period and consequently smaller losses were incurred.

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DEVELOPMENT OF THE DAYTIME FIGHTER ARM

UP TO 21 MARCH 1941

Developments in the daytime forces of the fighter arm in air defense can be summarized as follows: for the 10 May 1940 to 21 March 1941 period:

1. During the phase of intensified strategic air warfare, the fighter arm had the primary mission of providing protection for the offensive operations.

2. When the effectiveness of the bomber forces was no longer adequate, single- and twin-engine fighter units were given the added mission of carrying out bombing attacks.

278. Source 101.

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3. Commitment of the bulk of the existing fighter units in strategic missions made it necessary to assign the mission of home air defense to improvised units, the proper and primary mission of which should have been to train replacements.

4. The threat of daytime bombing attacks was not considered serious enough to require an increase in fighter strengths, for which reason no measures in this direction were initiated or even considered.

5. No logical conclusions were drawn from the visible steady decline in the actual and effective strength of fighter units concerning a more active program of production, repair, and training.

6. The Luftwaffe High Command evidently considered that it could handle the newly developing missions for its fighter arm in the east, southeast, and south without taking any measures to increase that arm's numerical strength. Main emphasis in air defense was placed clearly on the development of night-fighter forces.

While politico-military circles viewed future missions with optimistic equanimity, industrial circles regarded matters from the viewpoint of armament producing capacities and took the initiative by introducing measures to bring about a fundamental change in manufacturing

concepts.

One of the most prominent members, F. W. Siebel, an official economics controller (*Wirtschaftsführer*) and director of an aircraft factory, was a close personal friend of General Udet, at the time Chief of Luftwaffe Special Supply and Procurement Services. In July 1940 he discussed with General Udet the serious concern felt in industrial circles concerning the tendency to underestimate the significance of America's air armament capacities.

INDUSTRIALISTS DEMAND INCREASED AIR ARMAMENTS, 1940-41

On 7 October 1940 Siebel formulated in a memorandum the thoughts he had discussed orally with General Udet. In this memorandum he propounded the theory that, in view of the vast potential air armament capacities on the side of America of the Western Powers, it was essential to reckon in the foreseeable future not with thousands but with tens of thousands of the most up-to-date aircraft opposing the German forces. If German air supremacy could not be maintained it would become impossible, under attack by such enormous air fleets, to continue the activities necessary to sustain the armed forces and the population of Germany. If it was thought that America would come into the war, either as a combatant directly or indirectly by supporting Britain, then it was

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an imperative necessity to immediately increase German air armaments. The following requirements were stated:

1. Expansion of the raw materials supply basis.
2. Expansion of the basic manufacturing capacities, in particular measures to expand the manufacture of machine tools and drop forges.
3. Release of skilled workers from military service to satisfy the needs of the industry for specialist personnel.
4. Establishment of new factories.
5. Measures to insure fuel supplies.
6. Conversion of existing manufacturing techniques to those of mass production. Attention in the designing of aircraft to the requirements of mass production.
7. The issue of special powers of authority to those responsible for the air armament program.

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General Udet was deeply impressed by the memorandum and submitted it to Reich Chancellor Hitler. Hitler scanned it briefly. He rejected the statements it contained on America's air armament potential with the remark that the USA did not have adequate supplies of light metals, as evidenced by the collections of light metals already in progress there.

Following another discussion with General Udet, a more comprehensive memorandum was prepared. In the autumn of 1941 this memorandum was revised in the light of new information available on the air armament potential of the USA and forwarded to Hitler, Goering, and the Luftwaffe General Staff, and Siebel himself reported orally to Hitler on the subject. Hitler declared:

What is written here sounds quite good; it is possible that the gentlemen are right. But I already have victory in my pocket.

Hitler gave strict instructions that the contents of the memorandum under no circumstances were to be discussed in wider circles.

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ANTIAIRCRAFT ARTILLERY IN GERMANY AND THE WESTERN TERRITORIES, 1940-41

As previously stated above the air situation had become more precarious since 10 May 1940. The characteristic

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features of the enemy air attacks were that almost all of them were night attacks, and that they were directed without any systematic pattern, usually against targets of no military significance and situated outside of the effective range of the guns deployed in regions with strong anti-aircraft artillery defenses.

On the basis of its own concepts of air warfare, the German Air Command has assumed that the enemy would react to the military operations against France at least with sizable bombing attacks against the Ruhr region. However,

279. Sources 168, 169.

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no such concentrated action by the enemy had taken place, and the antiaircraft artillery forces massed to defend vitally important target areas had practically no opportunity to prove their defensive power. Most of the bombs were dropped at points which had no antiaircraft artillery defenses at all.

Disquieting facts, however, were the considerable penetration range Royal Air Force units had shown in their previously mentioned attacks against Berlin and the Skoda armament works at Pilsen, Czechoslovakia, and the knowledge that on the night of 16-17 December 1940 British bombers had ventured into the city areas of Mannheim, which was heavily defended by antiaircraft artillery, and had dropped a total of 100 tons of bombs on the area.

This situation called for new decisions concerning the antiaircraft artillery. The problems were:

1. How to expand antiaircraft artillery defenses to include all sizable settlements and industrial areas within the zone of interior, in order to protect the civilian population against attack in all territories within range of the enemy air forces. The territories of eastern Germany now also had to be included.

2. Reorientation in the equipment of antiaircraft

280. Source 129.

281. Source 112.

artillery units, with main emphasis on night defense operations.

3. The build up of antiaircraft artillery defenses in the occupied western territories.

Problem # 1 was a matter of the number of guns and personnel to service them available. Problem # 2 was one of firing techniques and of the availability of searchlights and radar instruments. Problem # 3 implied the release of antiaircraft artillery units from home defense.

From the records on a conference at headquarters of the Commander in Chief of the Luftwaffe on 21 July 1940 it is evident that a new program for the activation of units, to be completed in the 10 August to 1 October 1940 period, was established with a view to increasing the number of units in existence. The program called for the activation of searchlight units for the antiaircraft artillery arm in order to remedy the shortage of such units due to the increased requirements to meet the demands of the night fighter division.

It was emphasized particularly at the conference that the activation of the new units must not be allowed to interfere with the current effectiveness of the battalions already in existence.

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The best way to arrive at figures for the size of the activation program is by comparing the total number of batteries in the antiaircraft artillery arm on 31 July 1940 with the total available on 1 October 1940 as shown by the antiaircraft artillery disposition chart in the Office of the Commander in Chief of the Luftwaffe on these two dates. The figures are as follows:

	German Territories			Occupied Western Territories		
	Gun Batteries		Searchlight Batteries	Gun Batteries		Searchlight Batteries
	Heavy	Medium &		Heavy	Medium &	
	Light	Batteries		Light	Batteries	
1940						
Jul 31	423	333	143	234	227	45
Oct 1	490	242	152	245	232	54
Increase	67	109	9	11	105	19

Hence, the units activated in the 10 August to 1 October 1940 period totalled

78 heavy and 214 medium and light gun batteries and
28 searchlight batteries.

In order to meet the requirements for antiaircraft artillery defenses in the occupied western territories and to achieve the appreciable strength already existing on 31 July 1940 of 234 heavy and 227 medium and light gun

282. Source 105.

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batteries plus 45 searchlight batteries, the following measures had been taken:

1. All mobile antiaircraft artillery units deployed in Air Defense Zone West were transferred to the West.

After the campaign in France Air Defense Zone West ceased to exist and the equipment left there was moved to other areas for use in home defense.

2. Elements of the antiaircraft units committed in the home defense system were transferred to the occupied western territories to protect the ground service installations there.

3. After the end of the campaign in France the two Flak corps also were assigned local air defense missions in their assembly areas. However, their units could not be counted at full strength since they required rehabilitation after their strenuous operations in the campaign. Furthermore they were heavily occupied with preparations for support operations in the planned invasion of Britain. (Operation Sea Lion).

Plans for the future employment of the two Flak corps in purely operational type missions were due to the outstanding success they had achieved in the western campaign in integrated action with armored units.

283. Source 65.

284. Source 152.

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ACHIEVEMENTS OF THE TWO FLAK CORPS IN 1940

An examination of the success achieved by the two Flak Corps clearly shows the reasons for the decision taken concerning their future employment.

The I Flak Corps reported on 10 July 1940

372 aircraft shot down while airborne

252 aircraft destroyed or captured on the ground

47 tanks destroyed by weapons fire

30 bunkers destroyed

1 warship destroyed

12 warships, 3 cargo vessels, and 8 troop transport ships damaged.

The II Flak Corps after the close of the western campaign reported

214 aircraft shot down while airborne

207 tanks destroyed by weapons fire

17 armored and other forts destroyed

7 troop transport ships sunk and numerous other ships damaged.

The losses incurred by the II Flak Corps totalled

106 personnel dead or missing

312 personnel wounded

8 88-mm guns completely destroyed

4 37-mm guns completely destroyed

12 20-mm guns completely destroyed.

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It must be borne in mind here that the II Flak Corps was reinforced in the period from 19 May to 31 May 1940 by the 202d AAA Regiment, under Colonel Schilffahrt. This regiment comprised the following units:

1st (Composite) Battalion, 37th AAA Regiment

1st " " 61st " "

74th Light AAA Battalion.

Furthermore, from 12 to 18 May the 6th AAA Regiment of 2 composite and 2 light battalions was committed under command by the II Flak Corps.

REINFORCEMENT OF THE ANTI AIRCRAFT ARTILLERY DEFENSES IN GERMAN TERRITORIES

On 19 August 1940 the Joint Military Command (Oberkommando der Wehrmacht) issued the following instructions on reinforcement of the antiaircraft artillery defenses in German territories:

1. In view of the increasing penetration range of British bomber aircraft, antiaircraft artillery defenses must also be organized as speedily as possible in regions hitherto not so protected.

285. Sources 170, 181.

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2. Advantage will be taken of the existence of the new units organized by the Luftwaffe in August 1940 in particular to provide protection for the industrial centers of Upper Silesia, Saxony, Austria, and the Protectorate of Bohemia and Moravia (Czechoslovakia).

3. Throughout the eastern territories of Germany as many captured guns as possible will be emplaced permanently, organized in batteries, at important towns in the regions hitherto without protection.

4. All military materiel found in France which can be used in antiaircraft defense will be given top priority over all other movements for transportation to points designated by the Commander in Chief of the Luftwaffe, and all available means of transportation will be used for this purpose.

5. To fill the requirements of the Luftwaffe for personnel to man the antiaircraft barrage batteries, the Army will transfer officers, noncommissioned officers, and men, wherever possible artillery personnel, temporarily to the Luftwaffe.

Civilian personnel employed in the defense areas may also be required to serve in manning these guns.

6. Army units stationed in the zone of interior will immediately commence participating in air defense

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activities in such a manner that they can use those of their weapons which are suitable for antiaircraft action as required to do so by the appropriate Luftwaffe commands.²⁸⁶

These instructions reveal strikingly how unfavorably the scope of the missions to be performed had expanded in comparison with the available potentials. Here again, as had been the case with the employment of training units in tactical missions, a tendency towards improvisations is evident with an inherent large measure of delusion. The views held on the effectiveness of antiaircraft barrage fire with captured guns serviced by emergency personnel already exceeded all bounds of common sense.

Hitler personally held a very high opinion of the antiaircraft artillery. During a conference on 22 January 1941, in which the subject of air warfare was touched upon, he spoke of "....the necessity for a gigantic antiaircraft artillery force with very large supplies of ammunition."²⁸⁷

ANTIAIRCRAFT ARTILLERY FIRE CONTROL EQUIPMENT BASED ON RADAR OBSERVATION

The problem of fire control at night progressed towards solution as fast as the optical aiming devices could be replaced by radar instruments. The delivery of Wuerzburg A

286. Source 106.

287. Source 171.

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instruments, which commenced in May 1940 from serial production, proceeded very slowly, since this entirely new branch of industry also had to satisfy the urgent needs of other users, such as the night fighter arm, the aircraft reporting services, and the Navy.

Furthermore, the first series of instruments delivered did not meet the antiaircraft artillery specifications to full satisfaction and necessitated intensive training and practice on the part of the servicing personnel in collaboration with personnel servicing fire directing instruments.

In a report to the Commander in Chief of the Luftwaffe dated 31 December 1940 concerning his observations while on a tour of inspection, the Chief Antiaircraft Artillery Officer stated as follows:

1. In Air District Commands VI and XI the introduction of antiaircraft artillery radar instruments is proceeding without friction.
2. To compensate for the lack of sufficient radar instruments tests were carried out in the control of 3 batteries totalling 12 88-mm guns by a central station using only one Wuerzburg A instrument.

These tests were suggested by the night fighter division, which offered the use of its instruments

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for the purpose, the intention being to insure use of its instruments for antiaircraft fire control within the searchlight zone during periods of bad weather in which night fighters were unable to operate, so that the instruments were not in use.

The Chief Antiaircraft Artillery Officer, Office of the Commander in Chief of the Luftwaffe, sees no prospects of success in these tests, since hitherto all antiaircraft fire barrage zones, such as Air Defense Zone West, have proved ineffective, because, if they do not simultaneously serve the purpose of direct target defense, they can easily be bypassed or passed over at extreme altitudes by penetrating enemy aircraft.

3. It is to be expected that delivery of the new Wuerzburg C instrument, which relays the fire data automatically to the fire directing instruments and delivery of which is being expedited, will result in a considerable improvement in the effectiveness of antiaircraft fire at night.

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The specifications of the antiaircraft artillery for further development of antiaircraft artillery radar instruments required a special antiaircraft fire control instrument with specific niceties of a technical nature, such as

288. Source 172.

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target tracking and speed computing mechanisms, locating by instruments, transmission of data by electrical means.

These specifications resulted later in development of the

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Mannheim radar which replaced the Wuerzburg C instruments.

It was to be expected, therefore, that 1941 would bring an improved effectiveness of antiaircraft fire at night based on radar controlled fire directing instruments and independent of the vagaries of weather.

However, the solution of the technological problem immediately created a new problem, that of securing the highly qualified technical personnel required to service equipment of so complicated a nature. In his report of 31 December 1940 the Chief Antiaircraft Artillery Officer therefore drew attention to the necessity for a program of intensified training in this field.

ANTIAIRCRAFT ARTILLERY STRENGTHS IN 1941

According to the antiaircraft artillery situation map maintained in the Office of the Commander in Chief of the Luftwaffe, status as of 1 April 1941, the antiaircraft artillery arm in the spring of 1941 had the following forces available:

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Air District Command		Heavy Batteries	Medium & Light Batteries	Searchlight Batteries
I	Koenigsberg, Eastern Prussia	19	2	0
II	Poznan	9	0	0
III	Berlin	92	48	29
IV	Dresden	113	54	32
VI	Muenster	132	95	26
VII	Munich	38	52	7
VIII	Breslau	28	7	0
XI	Hamburg	110	115	36
XII/XIII	Wiesbaden/Nuremberg	65	85	21
XVII	Vienna	78	24	6
Total in all German territories		684	482	157
Norway		24	20	3
Holland		25	34	33
Belgium/Northern France		27	38	9
Western France		64	79	9
Rumania		48	62	3
Italy		18	5	0
Overall totals in non- German territories		206	238	57
				290

289. Source 22.

290. Source 105.

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The overall strength of the Luftwaffe in antiaircraft artillery forces on 1 April 1941 was thus 890 heavy batteries, 720 medium and light batteries, and 214 searchlight batteries.

The explanation for the reduced antiaircraft artillery forces in the western areas is that the two Flak corps had been transferred to the zone of interior after final cancellation of plans for an invasion of Britain.

In mid-November the I Flak Corps was moved to the command zone of Air District Command III and its commander at the same time was assigned as Commander of Air Defenses in Air District Command III. This command authority was extended on 1 January 1941 to include the command zone
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of Air District Command IV.

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The II Flak Corps was transferred in March 1941 to the Gruenau-Berlin area, where it was to prepare for the campaign against Russia.

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THE II FLAK CORPS IN 1940-41

After cancellation of the plans for an invasion of Britain the II Flak Corps was assigned an important air defense mission at the Channel coast.

An Order of the Day by Headquarters, II Flak Corps, on 31 July 1940 states the following mission for operations in the Lumbres (St Omer) region:

The II Flak Corps will continue to provide protection for the ground service installations in operation within its zone of operations, for the ports of Ostende and Boulogne, the artillery concentration at the coast, with main emphasis between Calais and Boulogne, and for the Freya radar stations.

This clearly reveals the exceptional potentials of the antiaircraft artillery arm in operational missions if the forces are fully motorized and consolidated and controlled uniformly in large units. It provided the ideal combination of the spear and the shield.

At the time under discussion here Headquarters, II Flak Corps controlled the following forces:

292. Sources 99, 181.

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Unit

Area of Operations

HQ, 6th AAA Regiment Ostende/Zeebrugge1st (Composite) Bn, 231st AAA
Regt1st " 24th AAA
Regt

761st Light AAA Bn

HQ, 136th AAA Regt. Boulogne (?)2d (Composite) Bn, 441st AAA
Regt (a battalion from the
Reich Labor Service)

84th Light AAA Bn

HQ, 201st AAA RegimentCalais/Gravelines and
airfields1st (Composite) Bn, 6th AAA
Regt

2d Bn, 26th AAA Regiment

1st " 64th " "

1st " 701st " "

73d Light AAA Battalion

2d (Light) Bn, AAA Tng Regt

3d (Searchlight) Bn, General
Goering Regt

3d Company, 201st Air Sig Regt

3d " 202d " " "

HQ, 202 AAA RegimentDunkirk, Nieuport,
and airfields

1st (Composite) Bn, 19th AAA Regt

1st Bn, 23d AAA Regiment

2d Bn 24th " "

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HQ, 202d AAA Regiment--Cont.

1st Bn, 37th AAA Regiment

1st " 61st " "

74th Light AAA Battalion

76th " " "

77th " " "

At the end of October 1940 the assigned units were reorganized, as follows:

II FLAK CORPS ORDER OF BATTLE

Status Late October 1940-15 December 1940

Unit	Assigned Area	Heavy Bttrs	Light Bttrs	Searchlight Bttrs
<u>HQ, 5th AAA Regiment</u>	Ostende			
1st Bn (less 1 hvy Bttr), 24th AAA Regt		2	2	
2d Bn, 24th AAA Regiment		3	2	
1st " 37th " "		3	2	
7th Company, Tng & Experimental Battalion		1		
3d (Searchlight) Bn, 36th AAA Regt				3
1st (Hvy) Bttr, 1st Bn, 24th AAA Regt	Zeebrugge	1		
84th Light AAA Battalion				3
Totals		10	9	3
<u>HQ, 701st AAA Regiment</u>	Calais			
1st Bn, 701st AAA Regt		3	2	

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<u>HQ, 201st AAA Regiment--Cont.</u>	<u>Area</u>	<u>Heavy Bttrs</u>	<u>Light Bttrs</u>	<u>Search- light Bttrs</u>
1st Bn, 6th AAA Regt		3	2	
1st Bn, 19th " "		3	2	
352d Reserve AAA Bn (Tactically assigned)		3	2	
73d Light AAA Bn			3	
309th (Searchlight) Bn (Reserve)				3
2d AAA Bn, AAA Tng Regt	Graveline Airfields			3
Totals		12	14	3
 <u>HQ, 202d AAA Regiment</u>	Dunkirk			
1st Bn, 61st AAA Regt		3	2	
1st " 23d " "		3	2	
369th (Searchlight) Reserve AAA Bn				3
74th Light AAA Bn	Nieuport Airfields			3
Totals		6	7	3

The total strength of the II Flak Corps along the Channel coast from the end of October 1940 on was thus 28 heavy batteries, 30 light batteries, and 9 searchlight batteries.

Of the batteries listed as light, 30 in number, 3 were medium 27-mm batteries.

On 16 December 1940 Headquarters, II Flak Corps displaced from Lumbres to Tours and was assigned the mission of

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protecting the naval bases along the Atlantic coast from St Nazaire to Biscarrosse with newly allocated antiaircraft artillery units.

No fighter forces were moved into the area of this coastal sector, so that the antiaircraft artillery forces had the sole responsibility for air defense, a renewed proof of the high esteem in which they were held.

II. FLAK CORPS ORDER OF BATTLE

STATUS 30 December 1940

Unit	Command Post	Assigned Area
<u>HQ, VI AAA Brigade</u>	Fontenay le Comte	St Nazaire-Biscarrosse
<u>HQ, 40th AAA Regiment</u>	Nantes	St Nazaire-Nantes-Challans
1st (Composite) Bn, 701st AAA Regt	St Nazaire	
292d (Composite) Reserve AAA Bn	"	
991st Light AAA Bn	Chateau Briort	
309th (Searchlight) Reserve AAA Bn	still en route	
<u>HQ, 45th AAA Regiment</u>	Bordeaux	La Rochelle-Biscarrosse
Task Force La Pallice (Tactically assigned)	La Pallice	
Task Force Royan (Tactically assigned)	Royan	
1st (Composite) Bn, 24th AAA Regt	St Germain	
75th Light AAA Bn (minus 1st Bttr)	Chateau Chrysipy-Tallence	

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Unit	Command Post	Assigned Area
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Hq, 45th AAA Regiment--Cont.	Bordeaux	La Rochelle-Biscarosse
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83d Light AAA Bn	Bourg s.G.
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901st Reserve AAA Bn	Elanquefort
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923d Light AAA Bn	Pauillac
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298th (Searchlight)	
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Reserve Bn	Elanquefort
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127th Reserve AAA Bn (Composite)	Bordeaux-Merignac
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1st Btr., 75th Light AAA Bn	Bordeaux-Merignac
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The effective strengths available on 30 December 1940

were as follows:

Unit	Heavy Batteries	Light & Medium Batteries	Searchlight Batteries
<u>6</u>			
40th AAA Regiment	7	8 3 (Army units)	-
45th AAA Regiment	7	14 1 (Army unit)	3
Task Force Fallice	1 (Army unit)	2 (Army units)	
Task Force Royan		2 (Army & Navy units)	
Total	15	30	3

In a Corps Order of the Day of 27 January 1941 the II Flak Corps assumed command over Naval AAA Brigade V, Lorient, as of 1 February 1941.

On 3 March 1941 Headquarters, II Flak Corps transferred to Gruenau/Berlin.

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A remarkable feature in the disposition of antiaircraft artillery forces, status 1 April 1941, is the heavy commitments in Norway, Rumania, and Italy. Totalling 90 heavy, 87 light and medium, and 6 searchlight batteries these commitments seriously reduced German air defense potentials in the zone of interior and in the western occupied territories. This shows clearly the vicious circuit that had developed of a large number of missions resulting in the necessity for an overhasty increase in the number of antiaircraft artillery units, which in turn reduced the quality of units on the whole and therefore necessitated greater expenditures to achieve success in the defense, so that the requirement again arose for increased strengths.

REORGANIZATION OF THE HOME AIR DEFENSE SYSTEM IN 1941

In the field of organization, responsibility for air defense of the territories of Germany at the beginning of 1941 still rested with the First, Second, and Third Air Fleets.

The areas most seriously threatened by air attack in the West were those of Air District Commands XI, VI, XII/XIII, and VII, and they were all within the command zones of the Second and Third Air Fleets, which devoted most

of their thought to their missions of strategic air warfare against Britain.

In practice the air defense mission within Germany was left completely to the air district commands, and in areas of main concentration to the air defense commands.

The big disadvantage here was that the air district commands were overburdened with responsibilities for the ground service organization and other logistical problems and also had not enough highly qualified staff officers who could have attended expertly to the needs of the fighter and anti-aircraft artillery defenses. Furthermore, the triple subdivision of responsibilities within Germany resulted in a lack of uniformity which had seriously adverse effects on fire training, firing techniques, and fire discipline in spite of the centralized co-responsibility of the Inspectorate for Antiaircraft Artillery.

In view of these intolerable circumstances the Commander of Air defenses in Air District Commands III and IV, General Weiss, took the initiative and in a study submitted on 31 January 1941 recommended a realignment of the air defense organization in the zone of interior.

His recommendations aimed at taking some of the burden from the Second and Third Air Fleets by relieving them of their command over Air District Commands VI, VII, XI, and

XII/XIII and suggested three possibilities to this end:

1. 1. Establishment of a central command, such as a "Home Air Fleet" and the assignment of all air district commands within Germany to this headquarters.
2. Direct control of the air defense districts and of home air defense by the Commander in Chief of the Luftwaffe.
3. Establishment of a "Home Air Defense Command" responsible exclusively for air defense and comprising only antiaircraft artillery corps, divisions, and brigades, fighter commands, and chiefs of passive air defense systems. This would have relieved the air district commands of their tactical air defense missions and left them responsible exclusively for the ground service organization and other logistical support.

After a careful study of all possibilities and probably in view of the impending operations in the east, southeast, and south, the Commander in Chief of the Luftwaffe on 3 March 1941 decided on the establishment of an Air Command Center.

This headquarters was established on 21 March 1941 and designated Luftwaffe Commander in Chief Center (Luftwaffe Befehlshaber Mitte) and will be referred to in this study as Air Command Center. The new headquarters was

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assigned control over

Air District Commands

III/IV, VI, XI in all respects;

Air District Commands in tactical matters of air defense concerning fighter, anti-aircraft artillery, aircraft reporting, air traffic control, and passive air defense forces;

the night fighter division in all respects. However, the commanding general of the division, General Kammhuber, was simultaneously responsible directly to the Commander in Chief of the Luftwaffe in his post as Inspector of Night Fighter Forces.

the Senior Commander of
Air Service Units (Luft-
dienstverbaende)

The air service units were closely linked with the antiaircraft artillery training program, since they were required to furnish the targets for firing practice.

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Air District Commands I (Eastern Prussia) and II (Poland) remained under the First Air Fleet, Air District Commands VIII (Silesia and the Protektorat of Bohemia and Moravia), and XVII (Austria) under the Fourth Air Fleet.
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These organizational changes insured the desired uniform control in air defense activities and in many fields gave new impetus to the development of the defense system.

At the same time, however, the changes reveal the realization of the Luftwaffe High Command that the strategic orientation of air power towards the east and south again brought the problems of defense against air attacks from the west into prominence, particularly so because the operational air forces would be committed in other theaters of operations.

Once the organizational conditions had been created for a firm control of air defense activities during day nature of the night it was purely a matter of the scope and means available which would decide whether decisive success could be achieved in the repulsion of air attacks.

THE AIRCRAFT REPORTING SERVICES IN 1940-41

With the occupation of the western territories the extensive mission evolved of expanding the aircraft

293. Sources 65, 173.

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reporting network to cover all territories between the borders of Germany and the Channel and Atlantic coasts from Holland to the Spanish frontier. The execution of this mission was ordered in the directive issued by the Commander in Chief of the Luftwaffe dated 30 June 1940 under the title "General Directives for Operations of the Luftwaffe against Britain" (Allgemeine Weisung fuer den Kampf der Luftwaffe gegen England). The instructions contained in the directive also dealt with agreements between the Second and Third Air Fleets on the one hand and various naval commands on the other concerning the organization of a sea-borne aircraft reporting service, in the outpost areas off the Channel and Atlantic coastlines.

As a first measure five Freya radar instruments were moved from the zone of interior after the end of the western campaign to the Channel coast, as follows:

from Vilsum to Bergen op Zee, Holland

from Kleve to Hock van Holland

from Stadtjylland to Hamstede/Vlissingen

from Landstuhl to Cap de La Hague, Normandy.
(2 instruments) 294

Radar observation by these instruments was to be supplemented by the coastal patrol activities of tactical air reconnaissance units, also ordered in the directive of 30

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30 June 1940. The purpose of these coastal air patrols was to detect enemy air forces approaching at low altitudes, which could only be detected at very close ranges by the radar instruments, which operated on the direct line of vision principle.

The air units assigned for these patrol activities were as follows:

Under	Unit	Strength & Aircraft Type
Air District Command Holland Tac Recon Group	4th Squadron, 23d	6 Hs-126 planes
Air District Command Belgium	1st Squadron, 21st Tac Recon Group	6 "
	2d Squadron, 21st Tac Recon Group	6 "
II Air Corps	4th Squadron, 31st Tac Recon Group	9 "
	5th Squadron, 32d Tac Recon Group	9 "
V Air Corps	<u>HQ, 21st Tac Recon Group</u>	
	1st Squadron, 12th Tac Recon Group	9 "
	5th Squadron, 15th Tac Recon Group	9 "
	4th Squadron, 21st Tac Recon Group	9 "
IV Air Corps	<u>HQ, 31st Tac Recon Gp.</u>	
	2d Squadron, 12th Tac Recon Group	9 "
	1st Squadron, 41st Tac Recon Group	9 "
	4th Squadron, 22d Tac Recon Group	9 "
	2d Squadron, 31st Tac Recon Gp	9 "
	2d " 13th " " "	9 "
	2d " 41st " " "	0 "
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295. Sources 149, 174.

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In December 1940 the above squadrons were withdrawn from their mission since they were at a hopeless disadvantage with their Hs-126 planes against the British fighters.

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ers.

The development of a completely integrated aircraft reporting network in the territories between the Channel and Atlantic coastline and the borders of Germany was a responsibility of the air district commands established after the opening of the western campaign. (Appendix 5), as follows:

Air District Command	Headquarters	Commanding General
Holland	Amsterdam	General Haubold until 1 Jul 40, then General Siburg
Belgium and Northern France	Brussels	General Loeb until 1 Aug 40, then General Pflugbeil until 29 Aug 40, then General Wimmer
Western France	Etampes	297 General Dr. Weissmann.

296. Sources 150, 159.

297. Sources 154, 175.

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During the initial phases of the work the motorized aircraft reporting companies of the Air Signal Corps were available for the purpose. With the establishment of wire communications they were supported and in some cases relieved by reserve units.

A highly important factor for the compilation of the air situation was the employment of field agencies of the Radio Intercept Service in the occupied western territories. Field centers controlling a number of intercept stations were established at the following points:

Oslo as Weather Service Center 5 (W-Leit 5)

Schepdael/Brussels as " " " 2

Paris as " " " 3

Direct communication lines between the fighter command posts in the west and their nearest intercept stations insured the prompt transmission of the information obtained in this way.

In the case of the 3d Fighter Command, with its command post at Cherbourg/Theville, for example, cooperation was perfected to such a degree that data from the intercept station on the position of British fighter units--gathered from their radio communications--could be translated immediately into orders for the fighter units with the objective of placing them in favorable attack positions.

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to attack the British fighters from the rear and above

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and from the direction of the sun.

For the night fighter forces a local agreement was

made. The Weather Service Center 3 had an intercept stat-

ion at Zeist. This station passed on to the night fight-

er division, unofficially, all intercepted information

which might prove useful for night fighter operations.

This obviated the time-consuming reporting channel through

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Weather Service Station 3-ZA at Berlin.

AIRCRAFT REPORTING MISSION OF THE NIGHT

FIGHTER DIVISION

From its inception the signal organization of the

night fighter division developed into a special aircraft

reporting service within the general aircraft reporting

service. With its Wuerzburg A radar instruments the divi-

sion was able to obtain a far more accurate picture of the

current air situation than could be obtained by means of

the general reporting service which relied on visual and
oral observation.

Initially, the need for secrecy prohibited the inclu-

sion of the radar system in the reporting system of the

general aircraft reporting services in order not to reveal

the technical aspects of night fighter operations. However

close cooperation with the antiaircraft artillery insured

299. Source 177.

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that the antiaircraft artillery forces were also kept informed on the air situation as interpreted at the command post of the night fighter division. Since the antiaircraft artillery was responsible for the air raid warning system there was no necessity to inform the aircraft reporting centers on all details of the air situation. If the night fighter arm had been required to do so during its build up, this would have involved an extra burden because of the necessity to develop the required signal communications.

The aircraft reporting authorities criticized these circumstances severely and it is impossible to overlook the fact that the dual channels resulting as time passed produced conditions in which differing air situation intelligence and differing interpretations of the air situation occurred.

299. Source 177.

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This was because of the different means available for the gathering of information. The night fighter division interpreted the air situation according to the reports received from its network of radar stations, which as time passed was built up to cover all areas without a gap. The antiaircraft artillery added to this the information received through its own specialized radar reporting system to obtain a local interpretation in each area. The general aircraft reporting service, in turn, computed its own interpretation based on the reports received from its own organization, which were based on visual and oral observation. This resulted in three different interpretations which did not always correspond.

THE PASSIVE AIR DEFENSE SYSTEM IN 1941

In the field of passive air defense a better working basis was provided in 1941 through the establishment of a special inspectorate, the Passive Air Defense (Home) Inspectorate, Inspectorate L IN 13, in the Office of the Commander in Chief of the Luftwaffe to control all activities of this type.

The inspectorate was organized in three branches, as follows:

Branch I . Responsible for control, organization, and operations; Protection of special

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official establishments (sonderen Verwaltung-

en); Motorized air raid protection units; The

air raid warning system; Signal communications

within the passive air defense system.

Branch II. Responsible for the implementation of general

passive air defense measures; Administration;

Legal affairs; Procurement.

Branch III. Technological affairs; Fire fighting; Gas

protection; Construction for passive air raid

purposes; Camouflage, concealment, and black

out measures.

Passive air defense measures were carried out within

Germany under control by the air district commands by the

local civilian authorities of the counties, cities, and

villages.

The air district commands had direct control over

the motorized air raid protection units, the air defense

commands, and the technical troops employed in the

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construction and operation of dummy installations, as well as the smoke screening units.

In the occupied territories the joint military commands were responsible for the handling of passive air defense problems for all three branches of the military establishment.

The results produced by enemy bombing attacks in 1940 and up to the spring of 1941 were still so insignificant that they could be handled without difficulty by the passive air defense forces organized at the beginning of the war in the form of motorized air raid protection units, factory air defense systems, individual air raid precautions, and the fire fighting police.³⁰⁰

GERMAN AIR DEFENSES, 1939-41

SUMMARY

In summarizing the following can be said of developments in the German air defense system during the period from the beginning of the war up to the establishment of Air Command Center on 21 March 1941:

1. The pre-war doctrine "Attack is the best form of defense" had proved sound in application against all enemies within the striking range of German air power. This made it possible to rely on the antiaircraft artillery for the local defense of targets

^{300.} Sources 64, 179.

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within Germany against air attack, and to employ the fighter forces primarily for participation in and protection of strategic air operations.

2. The resounding success achieved by the German fighter arm in repelling British bombing attacks during daylight in the few encounters which occurred compelled the British Royal Air Force to revise its concepts of strategic air warfare in line with the possibility of night bombing attacks.

For the German air defense system ^{this} meant that it was confronted with a problem for the solution of which neither the fighter nor the antiaircraft artillery forces were prepared.

With circumspection and energy conditions were created within a short space of time to insure the development of a well founded night fighter arm and of night firing techniques for the antiaircraft artillery which held out prospects of success.

3. The eastward, southeastward, and southward expansion of the areas of military operations placed a heavy burden on the air defense forces. For the fighter arm this resulted in the necessity already at this early stage to use in home air defense tactical units taken from the training forces. For the antiaircraft

artillery it resulted in a general lowering of performance standards due to the quick activation of large numbers of units necessitating emergency expedients in the assignment of personnel and materiel.

These developments can be viewed as linked causatively with continued adherence to concepts in which the employment of offensive air forces in operational air warfare was still considered the best way to serve air defense purposes.

The improvements brought about in the command organization of the air defenses necessarily could produce no advantageous results as long as the command lacked the forces required for the execution of its missions.

However, the current air situation in the West provided some justification for the views held at the time, since the British Royal Air Force apparently was not yet in any position to repeat its attempts at attacks during daylight or to increase the scope of its night attacks.

Whereas the requirements of the antiaircraft were just about met in the fields of industrial output and planning, no measures were taken to create conditions favorable for a continued expansion of the daytime

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fighter forces. This applied both to manufacturing capacities and to the training program.

This neglect or omission was probably due to an overestimate of the expected superiority in technical performances which would result with the introduction of the new fighter models, the Me-109-F, and the FW-190, which were placed in serial production in 1941.

A reestablishment of superiority in point of quality without fail would have compensated for numerical inferiority, as had been proved in Spain, Poland, and France.

In planning for the expansion of the night fighter arm advantage could be taken of the ambitious production program for the Me-110 twin-engine fighter model and, so far as strategic night fighters were concerned, of the large scale production program for bomber aircraft, since the Ju-88 and Do-17 models could be adapted for the purpose.